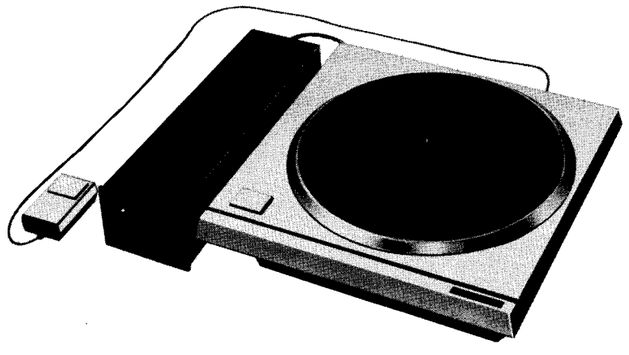
ORDER NO. SD7604-1071

Service Manual

Player

SP-10MKII (X)



■ SPECIFICATIONS

Type:	Direct-drive turntable	Wow & Flutter:	0.025% (JIS C5521) W.R.M.S. ±0.035% (DIN 45507), weighted, zero-to-peak
Turntable paltter:	Aluminum diecast, diameter 32 cm (12-19/32 inches), weight 2.9 kg (6.4 lbs.), moment of inertia 380kg. cm^2 (130 lbs. in^2)	Rumble:	60 dB (IEC 179B) - 50 dB (DIN 45539A) - 70 dB (DIN 45539B)
Motor:	Brushless DC motor, electronic rectification, quartz-controlled phase-locked servo circuit	Power Supply:	AC110/120/220/240V 50/60Hz
		Power Consumption:	20 W
Platter speeds:	33-1/3, 45 and 78.26r.p.m.	Dimensions:	Turntable Only 36.85 (W) x 10.25 (H) x 36.85 (D) cm (14-31/64 x 4-1/64 x 14-31/64 inches) Power Unit 110 (W) x 8.35 (H) x 37.0 (D) cm
Starting torque:	6 kg. cm (5.2 lbs. in)		
Build-up time	0.25 sec. (25° rotation) to 33-1/3r.p.m.		
Braking time:	0.3 sec. (30° rotation) from 33-1/3r.p.m. to standstill		
Speed fluctuation by load changes:	0% within 5 kg. cm (4.3 lbs. in)	Weight:	Turntable Only 9.5 kg (20.9 lbs.) Power Unit 3.8 kg
Speed drift:	Within ± 0.002%		

Specification are subject change without notice for further inprovement.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ PARTS IDENTIFICATION

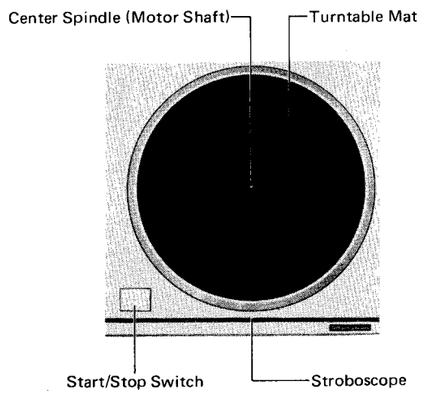


Fig. 1

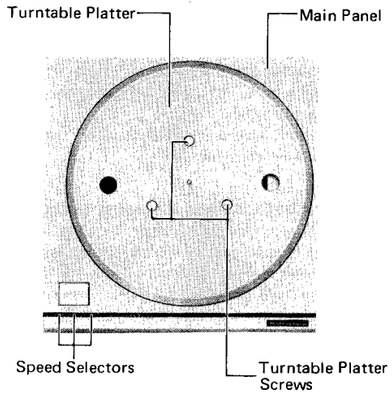


Fig. 2

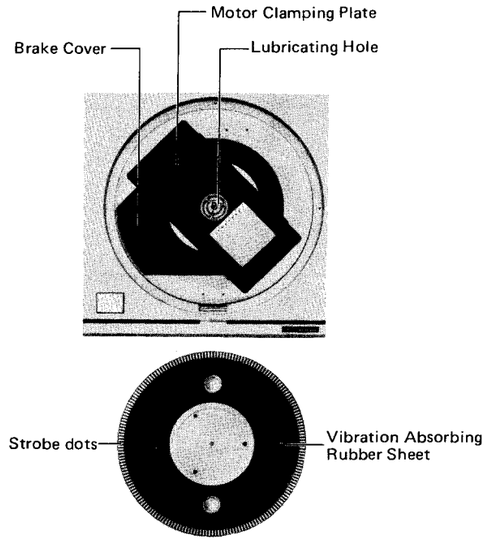


Fig. 3

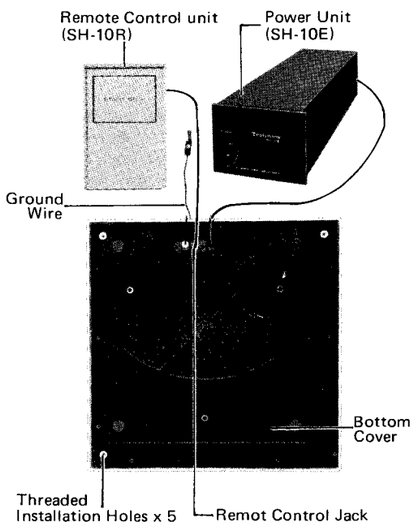


Fig. 4

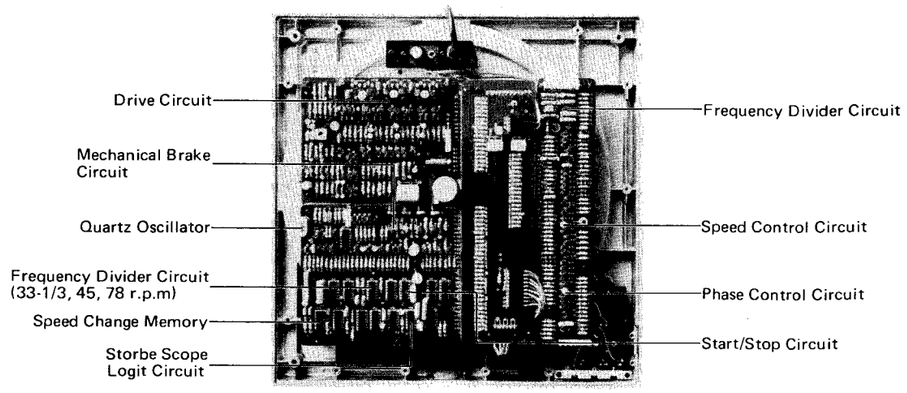


Fig. 5

■ ASSEMBLY AND SET-UP

1. Building a base or cabinet for this model

The starting torque of this model is 6Kg. cm. (5.2 1bs. in).
Thus the turntable platter which is heavy (2.9kg. 6.4 1bs.) and large (32cm. 12-19/32 inches) can be started and stopped quickly. For this reason we recommend that you use durable and heavy material. The thickness of the base should be 3cm. (1-11/64 inch) or more in order to bring out the best performance of model.

Note: Use durable and stable insulators (legs) Fig. 6 shows an example of cabinet construction.

2. Drill and cutout the bace according to the installation diagram.

As paper has a tendency to stretch we suggest that you check the diagram before using it as a template. Also check dimensions for printing errors. Check the tone arm mounting position for proper alignment (follow the tonearm manufacturers specifications). Also make sure to allow sufficient clearance for power connector and output terminals of the tone arm.

3. Install the unit in the cabinet

Two kinds of screws are included in the carton. Use the proper length of screw according to the thickness of the cabinet which you use. When you install the unit in the cabinet place proteotive material, on top of the unit to protect the center spindle from external damage. A soft cloth placed on the panel surface will protect it from scratches.

4. Remove the motor clamping plate and screws (Fig. 8)

After installation of the unit in the cabinet remove the seven blue screws and motor clamping plate.

NOTE: To protect the very delicate and important parts of the motor (spindle, motorshaft etc.) from external damage during transportation protective fittings have been installed. Be sure to remove these fittings carefully and save them for future use in case you again need to transport the unit.

NOTE: Dimensions are marked in millimeters. (25.4 mm are equal to inch.)

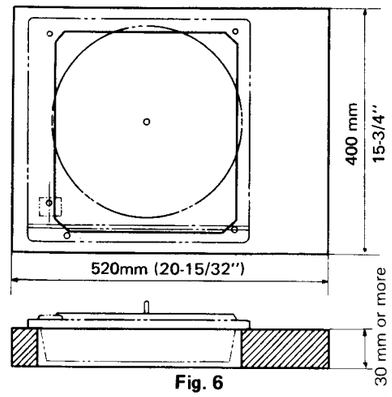


Fig. 6

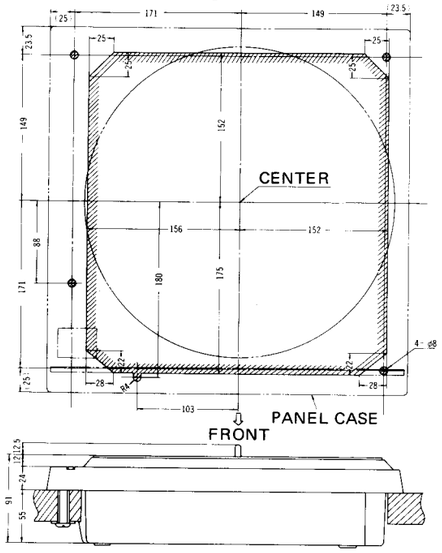


Fig. 7

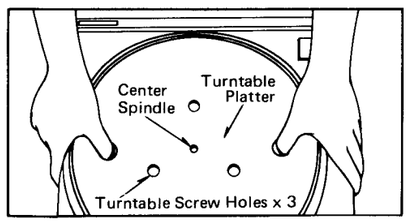


Fig. 9

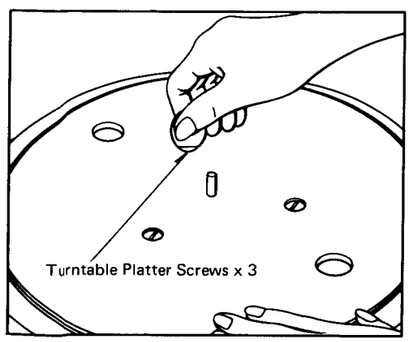


Fig. 10

5. Securing the turntable platter (Fig. 9 & 10)

Place the turntable platter on the spindle aligning holes in the platter with the rotor screw holes by eye.

Slightly lifting the turntable platter will make it easier to align the holes. Using the three screws supplied, firmly tighten the turntable platter and put the turntable mat on it.

NOTE: The turntable platter must be tightened at all three points. To assure proper operation.

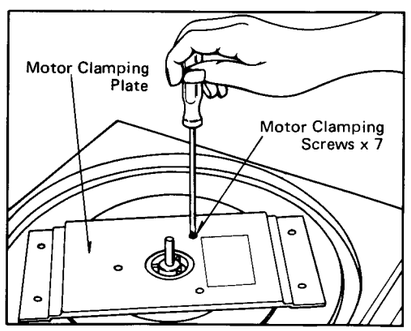


Fig. 8

■ OPERATION PRINCIPLES OF THE SP-10MKII

1. Quartz Generated Reference Signal

The quartz reference signal generator provides a reference signal which controls the action of the SP-10MKII. The oscillation of a quartz crystal is used. This oscillation is stable, highly accurate and not effected by temperature and other changes. The signal generated by the reference signal generator is split by the frequency divider into the appropriate frequency according to the speed selected.
The frequency divider is controlled by pushing the speed selector on the front panel of the unit. The selected speed information is stored in the speed change digital memory.

2. Stroboscopt Logic Circuit

The strobscope lights up the 190 stripes engraved on the platter rim. A neon lamp flashes according to instructive pulses from the stroboscope logic circuit. The circuit shapes digitally the signals from the frequency divider. This provides a sharp strobe image which is independent of external power source frequency.

3. Frequency Generator

A frequency generator is integrated with the platter drive motor. It is electromagnetic structure using a push-pull design cancels external induction. It converts accurately the platter rotation speed into a frequency. The output of the frequency generator is fed to the speed and the phase control circuits.

4. Phase Control Circuit

The phase control circuit detects a phase difference between a reference signal and a frequency generator signal and generates a control voltage. This circuit makes it possible to lock the rotation of the turntable platter to a reference signal. It improves considerably speed stability and speed control characteristics for load conditions when compared with the conventional direct-drive motor having only speed control as shown in Fig. 11 & 12.

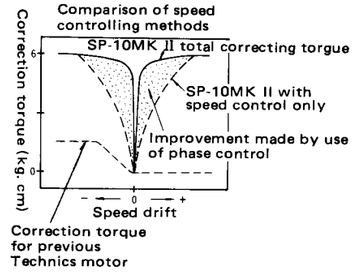

Comparison of speed controlling methods
SP-10MK II total correcting torgue
SP-10MK II with speed control only
Improvement made by use of phase control
Correction torque (kg. cm)
Speed drift
Correction torque for previous Technics motor

Fig. 11

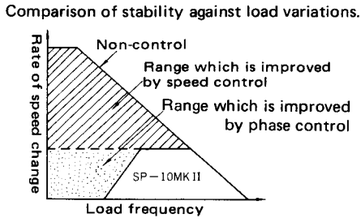

Comparison of stability against load variations.
Non-control
Range which is improved by speed control
Range which is improved by phase control
SP-10MK II
Rate of speed change
Load frequency

Fig. 12

5. Speed Control Circuit

The speed control circuit includes a sample-hold circuit, which converts the output of the frequency generator into an electrical voltage. This is the control voltage which maintains the platter rotation speed.

6. Drive Circuit

Two control signals are composed and applied to the drive circuit to maintain a forward motor-rotation. The drive circuit supplies fullwave drive current doubling current efficiency. It supplies drive current in both directions for a symmetrical rotation in either a forward or reverse direction.
The drive circuit rotates the turntable platter with quick response and large starting torque.

7. Start/stop Circuit

When the unit is started by the switch on the front panel or by the remote control, the start/stop circuit activates the forward drive. When the unit is switched off, the start/stop circuit activates the reverse drive and the mechanical brake actuating-circuits to perform a quick stop action.

8. Mechanical Brake Actuating-Circuit

The mechanical brake actuating-circuit operates a solenoid plunger which pushes a brake shoe against the platter. Working in conjunction with the reverse drive current, the mechanical brake can bring the platter to a complete stop quickly and smoothly. A half-braking force is maintained after the platter has stopped making it easy to accomplish accurate cueing of a record.

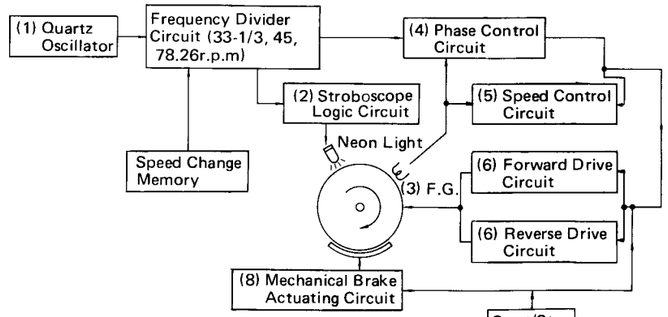


Fig. 13

■ THE PERIOD ADJUSTMENT METHOD (VR101 and VR102)

Note: If you repair the Control circuit board or the Drive Circuit board, you have to adjust VR101 and VR102.

1. Connect a dual-channel oscilloscope to points T and S on the circuit board.
   Point O is for the ground wire of the Control Circuit board.
2. Please refer to fig. 14 for the phase relation of the 2 waves for the adjustment of VR101 and VR102.
3. Please adjust in the order: 33-1/3r.p.m. 45r.p.m. 78r.p.m.

Speed Selector	Time	Adjustment Point
33-1/3 r.p.m.	6.3 ± 0.2ms	VR101
45 r.p.m.	4.7 ± 1.3ms	Confirm
78 r.p.m.	2.7 ± 0.1ms	VR102

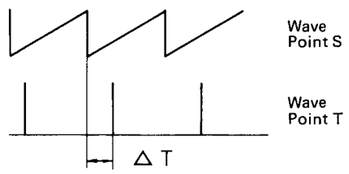


Fig. 14

■ BLOCK DIAGRAM

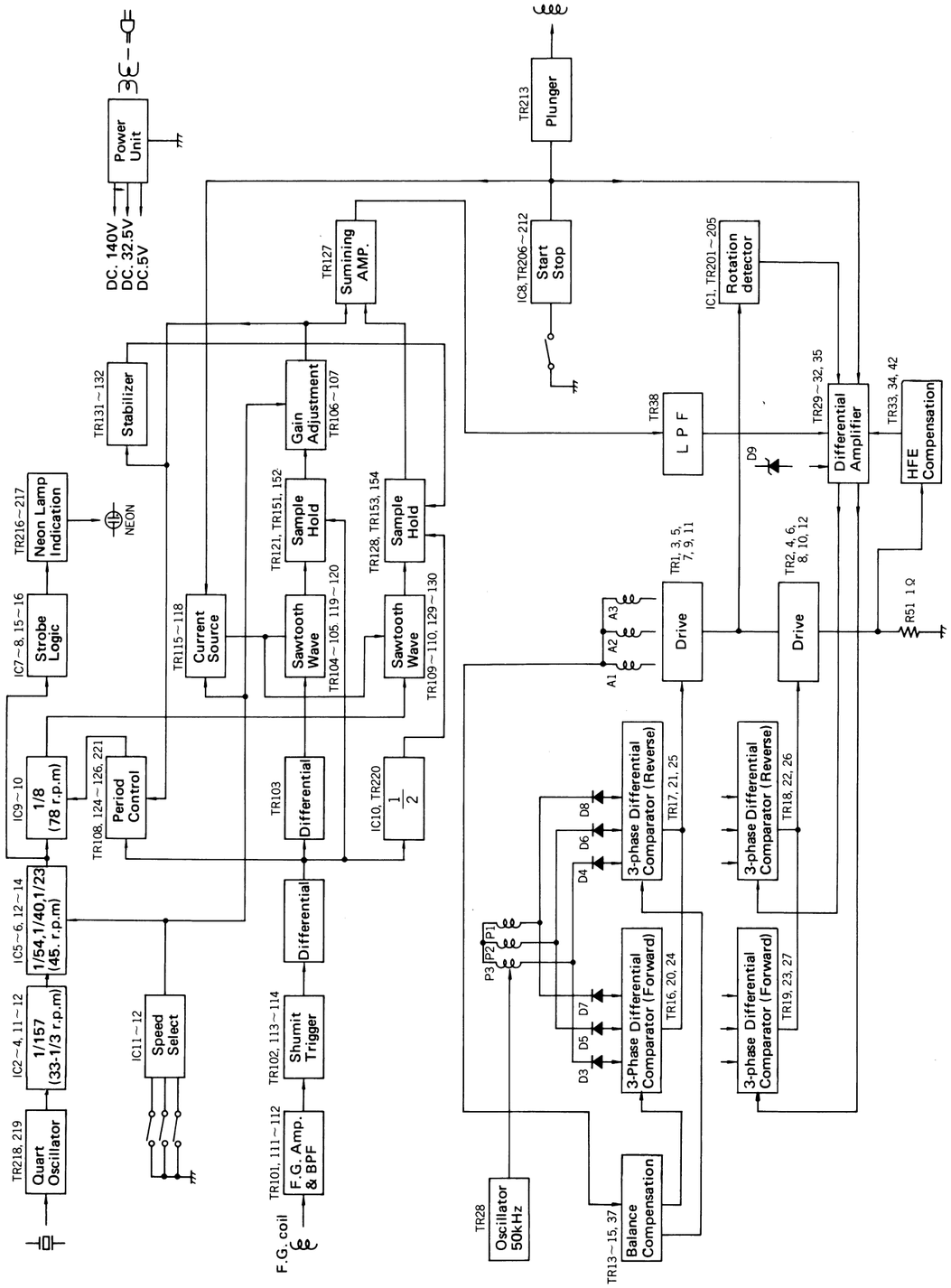


Fig. 15

■ SERVICE CHECK POINTS

(A) Switching on does not cause turn-table to rotate
- Check the Connecting board for voltage at points C1, C2, C4 (DC5V/32.5V/140V)
  - Voltage outputs are not DC5V/32.5V at respective points
    - Check the power circuit board voltage at points C1, C2, C4 (DC5V/32.5V/140V)
      - OK: • DC power socket (S • Lead wires
      - BAD: Primary of transforme
      - DC5V/32.5V constan output circuit (SH-10
  - Voltage outputs are not DC5V/32.5V at respective Points
    - OK: Check voltage on TR208 ~ TR213
    - BAD: Check voltage on I.C. 8 and TR206, 207 or start switch
      - BAD: Check voltage on I.C. TR201 ~ TR204 (Logic circuit board) TR39 ~ TR41 (Drive
      - OK: Check the Logic circuit board voltage at point P3 (DC 0.7V)
        - OK: Check the Drive ci wave form at poin
  - Voltage output are DC5V/32.5V/140V at respective points
    - Brake does not operate
      - Check the Logic circuit board for voltage on I.C.8 (⑫ ⑬)
    - Brake operates
      - Check the Control circuit board for voltage at point E15
        - BAD: Check voltage on TR115 ~ TR118 and D101, 106, 107 (Control circuit board)

(B) Selected speed (33-1/3 or 45 or 78r.p.m) does not cause turntable to rotate
- Check the Logic circuit board voltage at points E8 ~ 10.

Speed	E8	E9	E10
33-1/3r.p.m	0.2V	0.2V	3.9V
45 r.p.m	0.2V	3.9V	0.2V
78 r.p.m	3.9V	0.2V	0.2V

  - BAD: Check voltage on I.C. 11, 12 (Logic circuit board), or check Selector Switch
  - OK: Check voltage on TR115 ~ TR118 or D101, 106, 107

(C) Turntable rotates abnormally (all speed)
- Turntalbe rotates in wrong direction
  - Check the Connecting board voltage at point C2 (DC5V)
    - OV: Check the power-circuit board voltage at point C2 (DC5V)
      - Over DC32.5V: Check DC32.5V constant-voltage output circuit
        - BAD: Check th board wa point P1
    - Under DC5V: Check DC5V, Constant-voltage output circuit
    - DC5V: Check the power circuit board voltage at point C4 (DC32.5V)
      - DC32.5V: Check the Control Circuit board wave form at point e13
        - OK: Check th board wa point P1

(D) Turntable rotates abnormally (33-1/3, 45, 78r.p.m)
- Adjust control circuit board at point P10 Ⓢ and Ⓣ
  - Can't adjust, Period
    - Check the Control circuit board voltage at point e15
      - BAD: Check voltage at TR115 ~ TR118, D101, 106,107
      - OK: Check the Control circuit board voltage at Point P10 Ⓖ (DC27V)

(E) Wow. Flutter
- Check the Drive circuit board wave form on TR16, 17, 20, 21, 24, 25 (base)
  - BAD: Check TR16 ~ TR27 D3 ~ D8
  - OK: Check wave form on TR7 ~ TR12
    - OK: Check the Connecting board wave form at point A1 ~ A3
      - BAD: Check TR1 ~ TR6
      - OK: Check voltage on TR29 ~ TR35, TR37, 42
        - OK: Check voltage on TR13 ~ TR15, TR36

(F) Mechanical brake does not work
- Check the Logic circuit board voltage on TR213 (collector)
  - BAD: Check, TR213 or plunger or Diode (1S1887)
  - Brake mechanism

O
- OK: Check the Connecting board wave form at Point C2 (50 kHz)

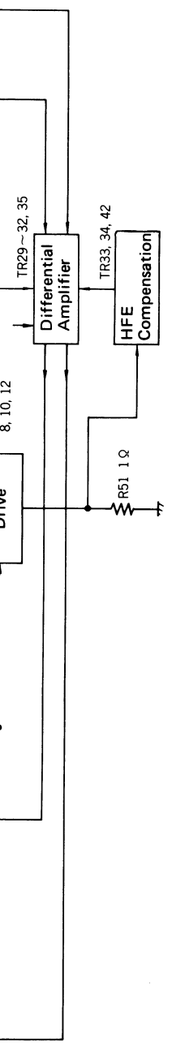
(G) Electronic brake does not work (Change speed selector from 78r.p.m to 33r.p.m (or 45r.p.m and check the amount of time it takes before speed stabilises)
- Check the Drive circuit board voltage on TR15, 36, 37
  - OK: Check the Drive circuit board voltage on TR17, 18, 21, 22, 25, 26
    - OK: Check the Connecting board voltage at point b1 (only stop)
      - Check the Logic ci board on TR210

(H) Neon lamp not illuminating or dim
- Check the connecting board voltage at point C1 (DC 140V)
  - BAD: Power Unit (SH-10E)
  - OF: Check the Logic circuit board wave form on I.C. 15 ① and ④
    - OK: Check, I.C. 7, 8, 16
    - BAD: Check the Connecting board wave form at point N1 and N2
      - BAD: Check, I.C. 15 and TR217, 216
      - NEON

(I) If the turntable is stopped manually and it does not resume turning when the hand is removed.
- Check the Drive circuit board voltage at points A1 ~ A3 (23V)
  - Check the Drive circuit board voltage on TR1 ~ TR12, TR16 ~ TR27, or D3 ~ D8.

(J) Turntable torque characteristics are bad
- Check the Control circuit board wave form at points Ⓢ and Ⓣ
  - OK: MOTOR
  - BAD: Adjust at Ⓢ and Ⓣ
    - Can't adjust, Period
      - Check, VR101, VR102

■ SERVICE CHECK POINTS



Notes: (1) Be sure, when adjusting VR101 or VR102, to confirm synchronization at 3 speeds (33-1/3, 45 and 78 rpm).

(A) Switching on does not cause turntable to rotate
- Check the Connecting board for voltage at points C1, C2, C4 (DC5V/32.5V/140V)
  - Voltage outputs are not DC5V/32.5V at respective Points
  - Voltage output are DC5V/32.5V/140V at respective points
    - Brake does not operate → Check the Logic circuit board for voltage on I.C.8 (⑫ ⑬)
      - OK → Check voltage on TR208～TR213
      - BAD → Check voltage on I.C. 8 and TR206, 207 or start switch
        - BAD → Check voltage on I.C.1 and TR201～TR204 (Logic circuit board) or TR39～TR41 (Drive circuit board)
          - BAD → Check voltage on TR28 and T1 (Drive circuit board)
            - BAD → Check voltage on TR1～TR12, TR16～TR27 or D3～D8 (Drive circuit board)
              - BAD → Check voltage and wave form on TR127, TR151～TR154 (Control circuit board)
              - OK → Check voltage on TR29～TR35, TR37, 38 and D9～D11 (Drive circuit board)
            - OK → Check the Drive circuit board voltage at point A1～A3 (DC 23V)
              - OK → Check the Drive circuit board voltage at point a2 (DC22V)
                - OK → Check voltage on TR29～TR35, TR37, 38 and D9～D11 (Drive circuit board)
          - OK → Check the Drive circuit board wave form at point C2
        - OK → Check the Logic circuit board voltage at point P3 (DC 0.7V)
    - Brake operates → Check the Control circuit board for voltage at point E15
      - BAD → Check voltage on TR115～TR118 and D101, 106, 107 (Control circuit board)
      - OK → Check the Logic circuit board voltage at point P3 (DC 0.7V)
- OK
  - DC power socket (SF D8D4F)
  - Lead wires
  - Primary of transformer (SH-10E)
- BAD → DC5V/32.5V constant-voltage output circuit (SH-10E)

(B) Selected speed (33-1/3 or 45 or 78r.p.m) does not cause turntable to rotate
- Check the Logic circuit board voltage at points E8～10.

Speed	E8	E9	E10
33-1/3r.p.m	0.2V	0.2V	3.9V
45 r.p.m	0.2V	3.9V	0.2V
78 r.p.m	3.9V	0.2V	0.2V

- BAD → Check voltage on I.C. 11, 12 (Logic circuit board), or check Selector Switch
- OK → Check voltage on TR115～TR118 or D101, 106, 107

(C) Turntable rotates abnormally (all speed)
- Turntalbe rotates in wrong direction
- Check the Connecting board voltage at point C2 (DC5V)
  - OV → Check the power-circuit board voltage at point C2 (DC5V)
  - Under DC5V → Check DC5V, Constant-voltage output circuit
  - DC5V → Check the power circuit board voltage at point C4 (DC32.5V)
    - Over DC32.5V → Check DC32.5V constant-voltage output circuit
    - DC32.5V → Check the Control Circuit board wave form at point e13
      - OK → Check the Control Circuit board wave form at point P10 Ⓣ
        - BAD → Check the Control circuit board wave form at point P10 Ⓕ
          - OK → Check voltage and wave form at TR102, 103, 113, 114
          - BAD → Check voltage and wave form at TR101, 111, 112
        - OK → Adjust, Control circuit board at point P10 Ⓢ and Ⓣ
          - BAD → Check voltage at TR108, 128, TR124～126 and TR220, IC10, 15 (Logic circuit board)
          - OK → Can't adjust, Period
            - Check the control circuit board voltage at point e15
              - OK → Check the Control circuit board voltage at point P10 Ⓖ (DC27V)
                - BAD → Check voltage at TR115～TR118, D101, 106, 107

(D) Turntable rotates abnormally (33-1/3, 45, 78r.p.m)
- Adjust control circuit board at point P10 Ⓢ and Ⓣ
- Can't adjust, Period
- Check the Control circuit board voltage at point e15
  - BAD → Check voltage at TR115～TR118, D101, 106,107
  - OK → Check the Control circuit board voltage at Point P10 Ⓖ (DC27V)
    - BAD → Check voltage and wave from at TR104～TR107, TR119～TR121, TR151, 152
      - BAD → Check voltage and wave form at TR102, 103, 113, 114
      - BAD → Check voltage and wave form at TR101, 111, 112
      - OK → Check voltage and wave form at TR127, TR151～TR154
        - BAD → Check voltage at TR218, 219 or X1
        - OK → Check waveform at P2

Speed	T (ms)
33-1/3	2.4
45	1.8
78 r.p.m	1.0

and I.C. 2～I.C.6, I.C.11～I.C.14

    - OK → Drive circuit board voltage at point A2
      - OK → Check voltage at TR29～TR35, TR37, 38
        - OK → Check the Logic Circuit board wave form at Point P1
          - BAD → Check voltage and wave form at TR104～TR107, TR119～TR121, TR151, 152
          - OK → Check the Logic circuit board voltage at points E8～10.

Speed	E8	E9	E10
33-1/3r.p.m	0.2V	0.2V	3.9V
45 r.p.m	0.2V	3.9V	0.2V
78 r.p.m	3.9V	0.2V	0.2V

            - BAD → Check voltage on I.C. 11, 12 (Logic circuit board) or Check Speed Selectro Switch
            - OK → Check the Logic Circuit board for wave form at point P2
              - OK → Check wave form at Point P2

Speed	T (ms)
33-1/3r.p.m	2.4
45 r.p.m	1.8
78 r.p.m	1.0

and I.C.2～I.C. 6, I.C.11～I.C. 14

(E) Wow. Flutter
- Check the Drive circuit board wave form on TR16, 17, 20, 21, 24, 25 (base)
  - BAD → Check TR16～TR27 D3～D8
  - OK → Check wave form on TR7～TR12
    - OK → Check the Connecting board wave form at point A1～A3
      - BAD → Check TR1～TR6
      - OK → Check voltage on TR29～TR35, TR37, 42
        - OK → Check voltage on TR13～TR15, TR36
          - OK → Check the Connecting board wave form at Point C2 (50 kHz)
            - OK → MOTOR
            - Check TR28 or Adjust T1

(F) Mechanical brake does not work
- Check the Logic circuit board voltage on TR213 (collector)
  - BAD → Check, TR213 or plunger or Diode (1S1887)
  - Brake mechanism

(G) Electronic brake does not work (Change speed selector from 78r.p.m to 33r.p.m (or 45r.p.m and check the amount of time it takes before speed stabilises)
- Check the Drive circuit board voltage on TR15, 36, 37
  - OK → Check the Drive circuit board voltage on TR17, 18, 21, 22, 25, 26
    - OK → Check the Connecting board voltage at point b1 (only stop)
      - Check the Logic circuit board on TR210

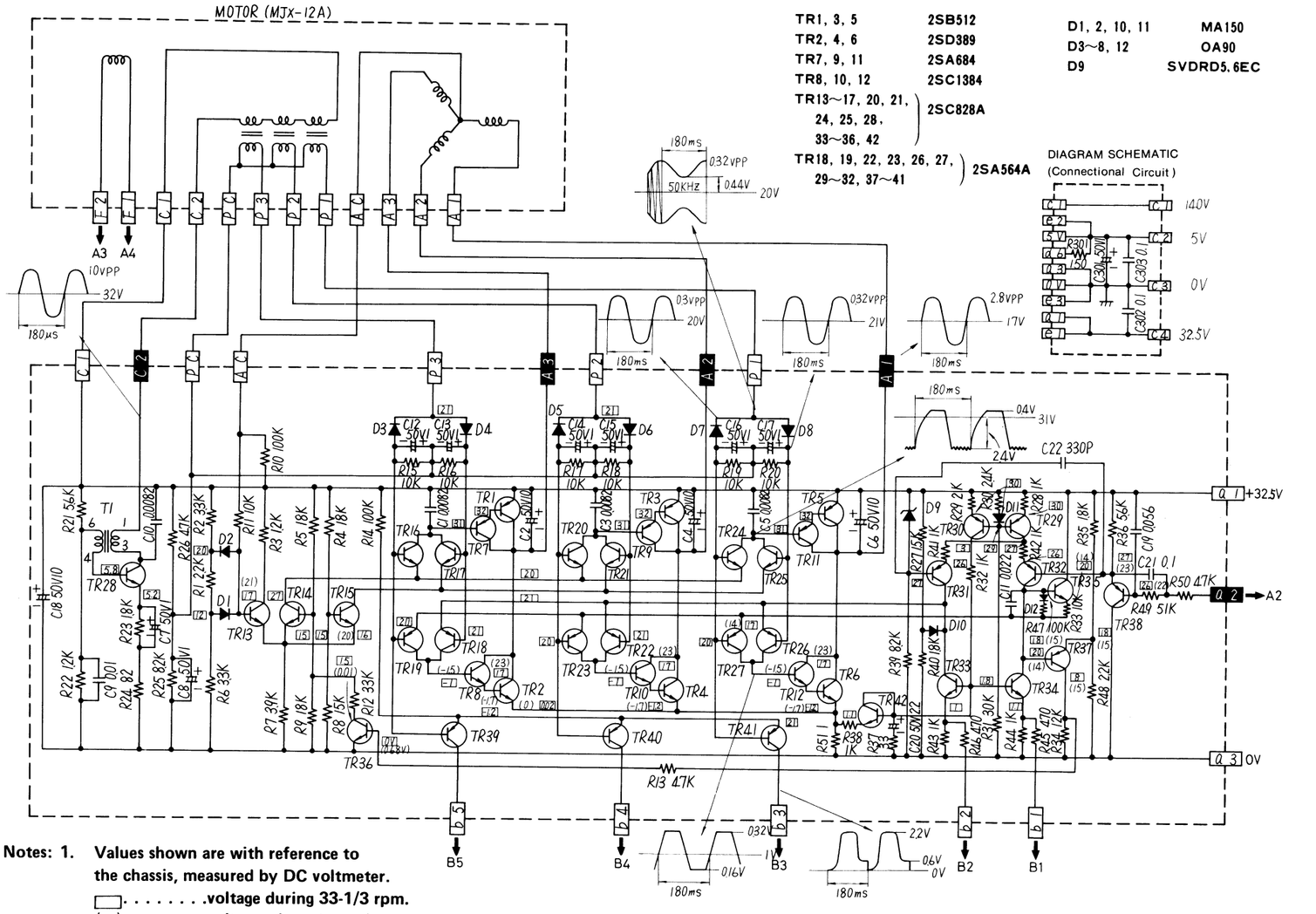
(H) Neon lamp not illuminating or dim
- Check the connecting board voltage at point C1 (DC 140V)
  - OF → Check the Logic circuit board wave form on I.C. 15 ① and ④
    - BAD → Power Unit (SH-10E)
    - OK → Check, I.C. 7, 8, 16
      - BAD → Check the Connecting board wave form at point N1 and N2
        - BAD → Check, I.C. 15 and TR217, 216
        - NEON

(I) If the turntable is stopped manually and it does not resume turning when the hand is removed.
- Check the Drive circuit board voltage at points A1～A3 (23V)
- Check the Drive circuit board voltage on TR1～TR12, TR16～TR27, or D3～D8.

(J) Turntable torque characteristics are bad
- Check the Control circuit board wave form at points Ⓢ and Ⓣ
  - OK → MOTOR
  - BAD → Adjust at Ⓢ and Ⓣ
    - Can't adjust, Period
      - Check, VR101, VR102

(K) When actuating, Turntable speed is slow
- Check the Drive circuit board voltage on TR29, 30, TR33～TR35
  - OK → MOTOR

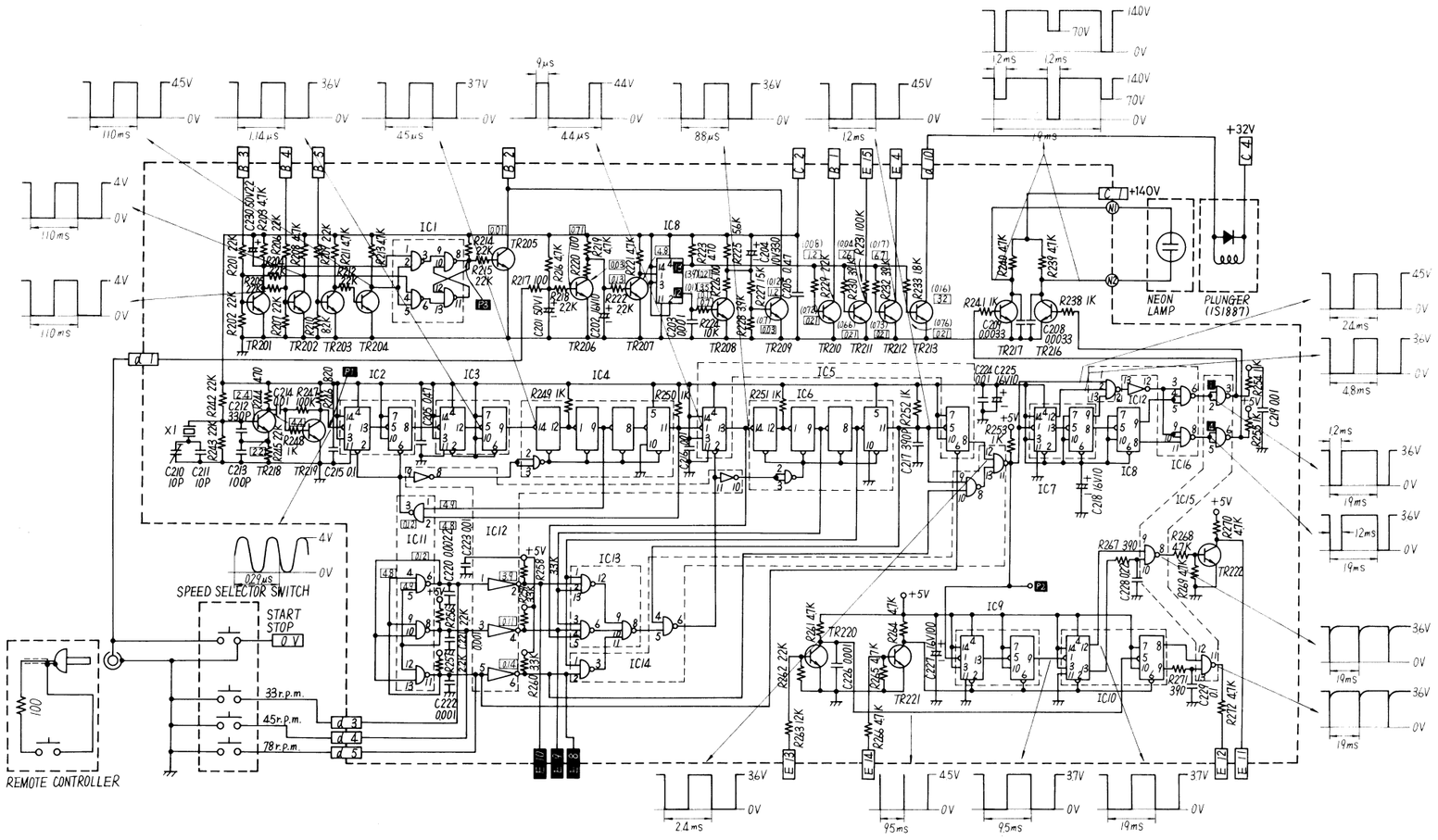
Schematic Diagram (Drive Circuit) ..... Model SP-10MKII-(X)



Notes: 1. **Values shown are with reference to the chassis, measured by DC voltmeter.**
□. . . . . .voltage during 33-1/3 rpm.
( ). . . . . .voltage when stopped.
Waveforms are during 33-1/3 rpm.

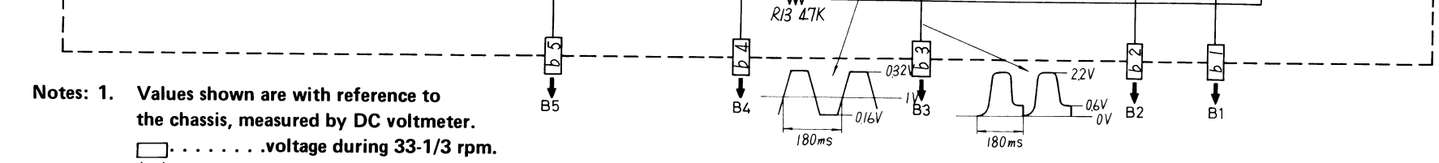
This schematic diagram maybe modified at any time with the development of new technology.

Schematic Diagram (Logic Circuit) ..... Model SP-10MKII-(X)



Notes: 1. **Values shown are with reference to the chassis, measured by DC voltmeter.**
□. . . . . .voltage during 33-1/3 rpm.
( ). . . . . .voltage when stopped.
Waveforms are during 33-1/3 rpm.

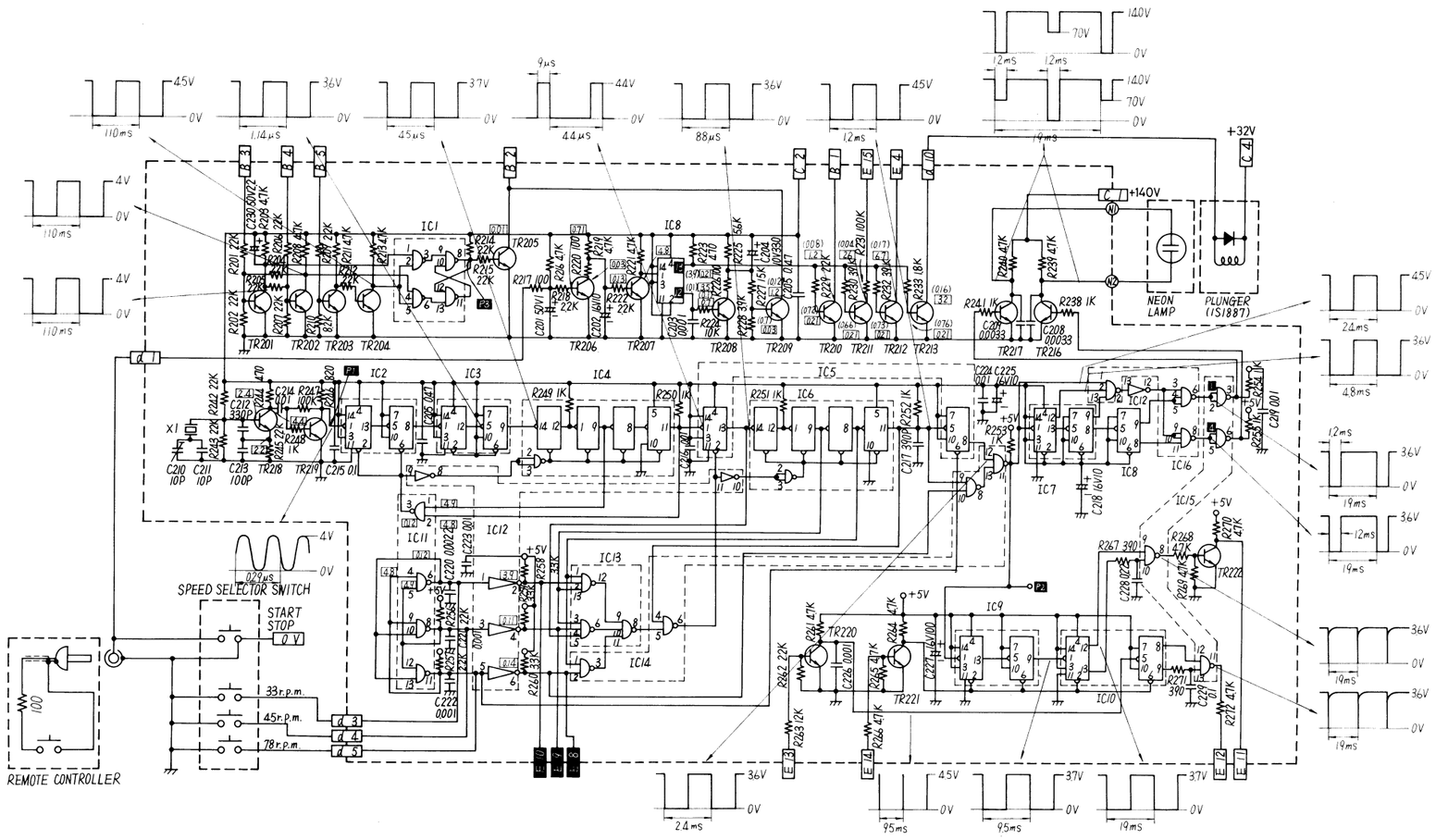
This schematic diagram maybe mddified at any time with the development of new technology.



Notes: 1. **Values shown are with reference to the chassis, measured by DC voltmeter.**
□. . . . . .voltage during 33-1/3 rpm.
( ). . . . . .voltage when stopped.
Waveforms are during 33-1/3 rpm.

This schematic diagram maybe modified at any time with the development of new technology.

Schematic Diagram (Logic Circuit) ..... Model SP-10MKII-(X)

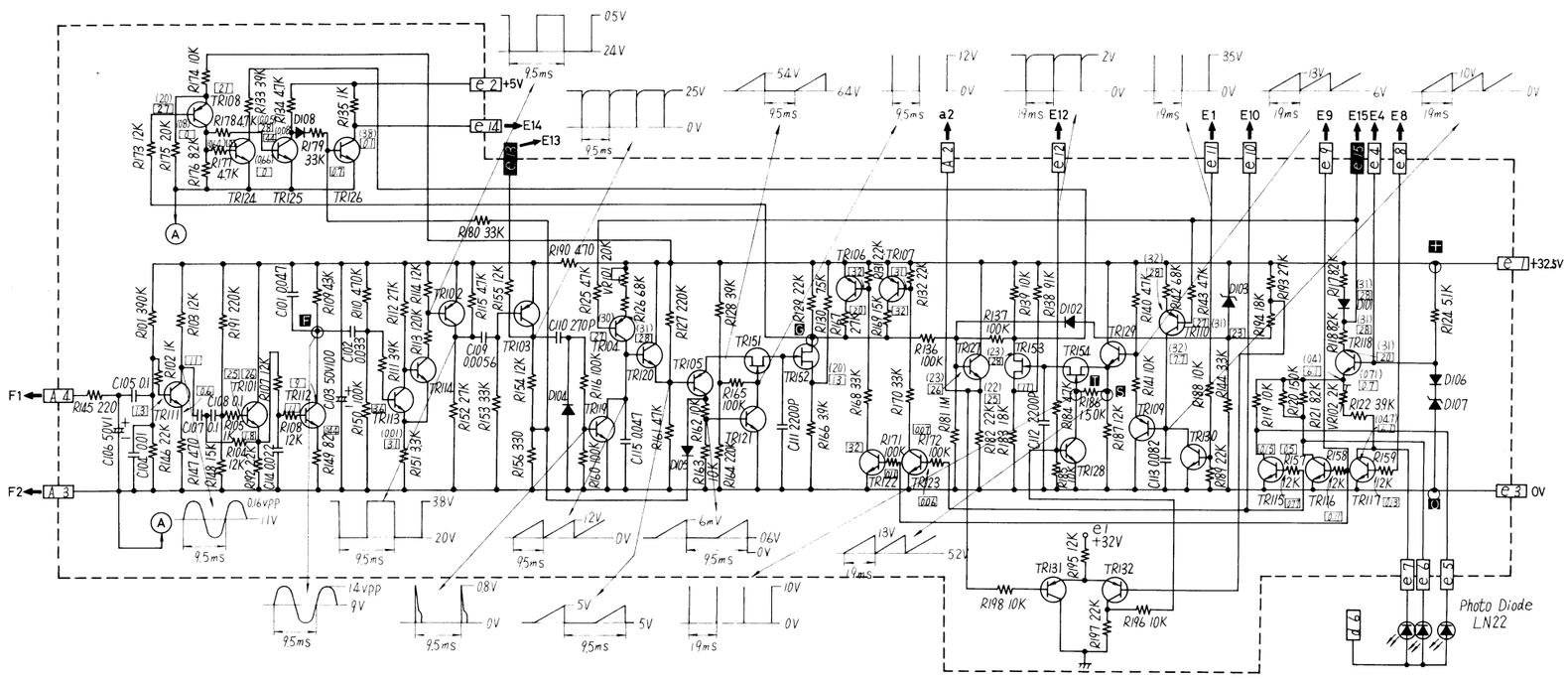


Notes: 1. **Values shown are with reference to the chassis, measured by DC voltmeter.**
□. . . . . .voltage during 33-1/3 rpm.
( ). . . . . .voltage when stopped.
Waveforms are during 33-1/3 rpm.

IC1	SVIM53200P	TR201~212 }	2SC828A
IC2, 3, 5, 7, 8, 9	SVIM53273P	218~222 }	
IC4, 6	SVIM53293P	TR213	2SC1384
IC11	SVIM5946P	TR216, 217	2SC1573
IC12	SVIM53204P		
IC13, 16	SVIM53210P		
IC14, 15	SVIM53200P		

This schematic diagram maybe mddified at any time with the development of new technology.

Schematic Diagram (Control Circuit) ..... Model SP-10MKII-(X)

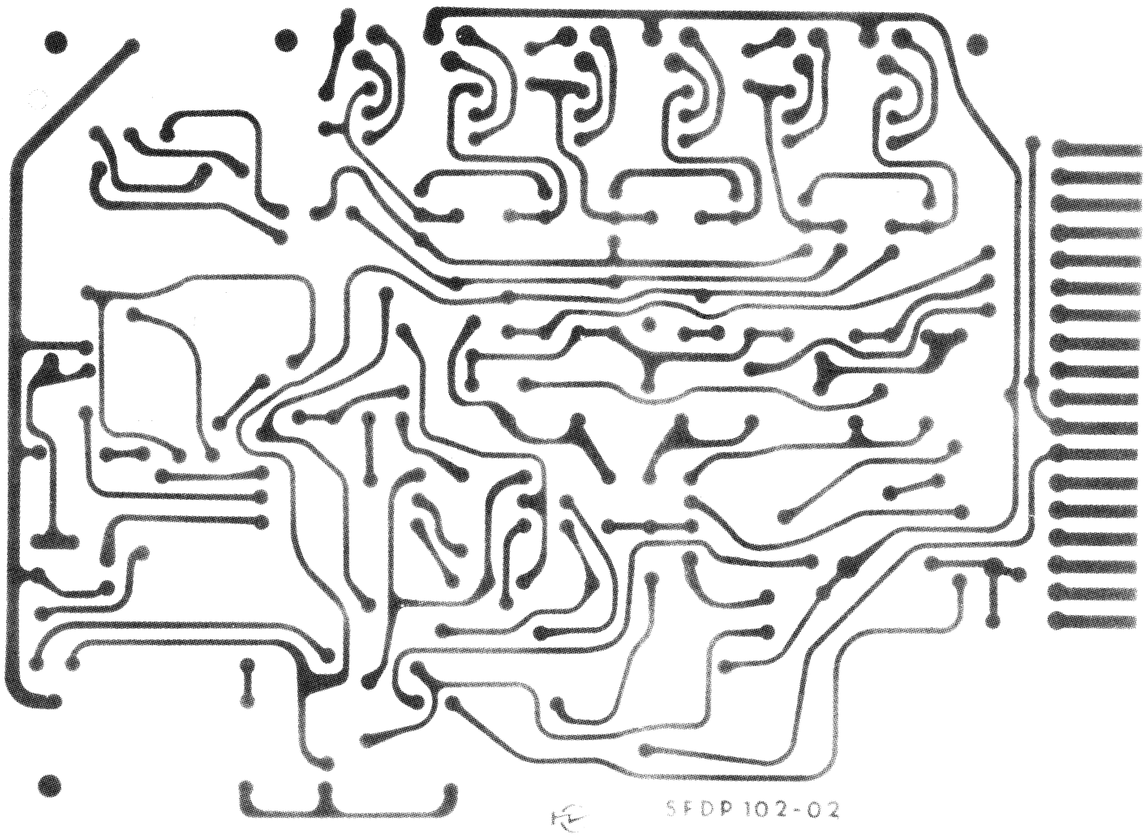


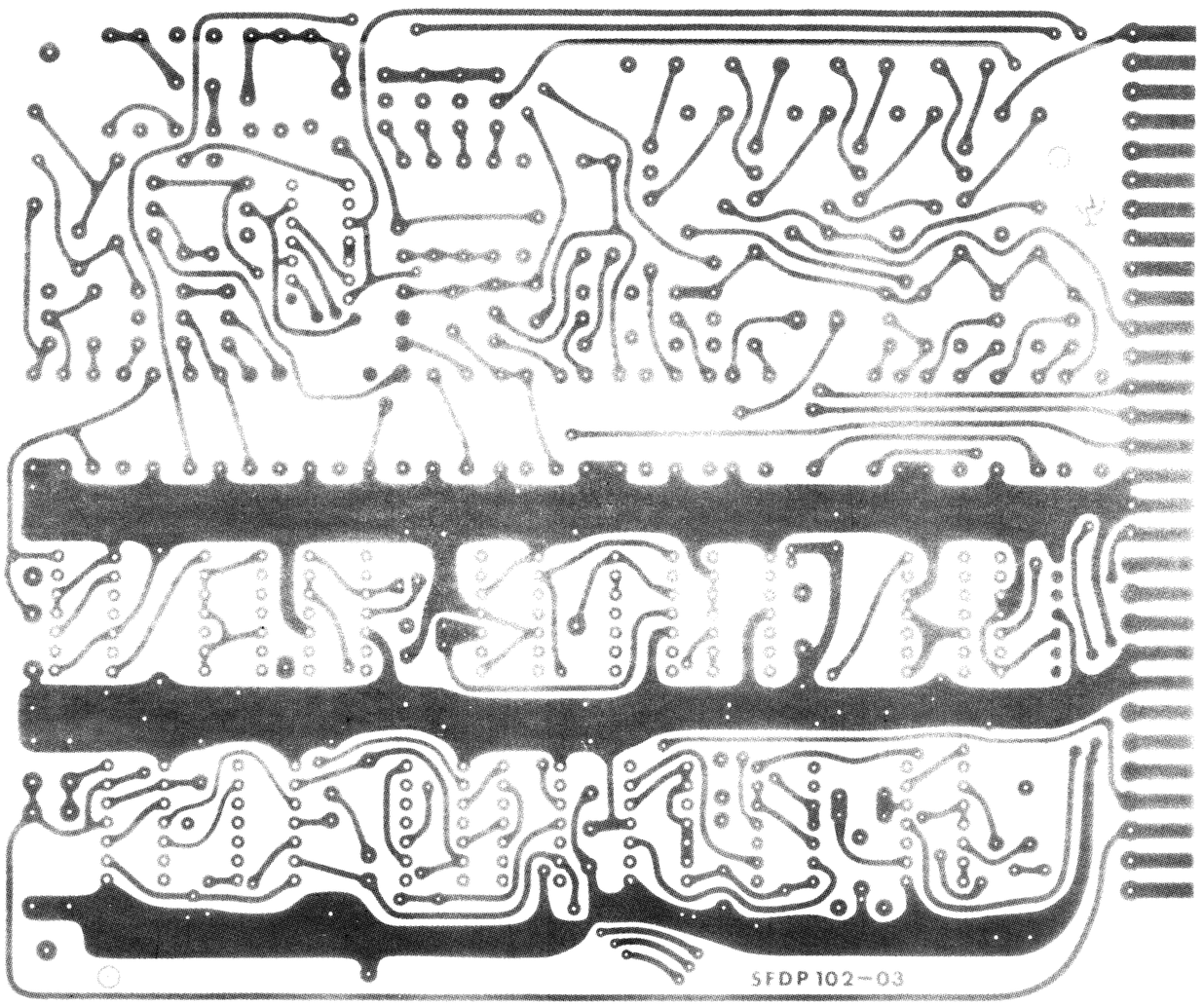
Notes: 1. **Values shown are with reference to the chassis, measured by DC voltmeter.**
□. . . . . .voltage during 33-1/3 rpm.
( ). . . . . .voltage when stopped.
Waveforms are during 33-1/3 rpm.

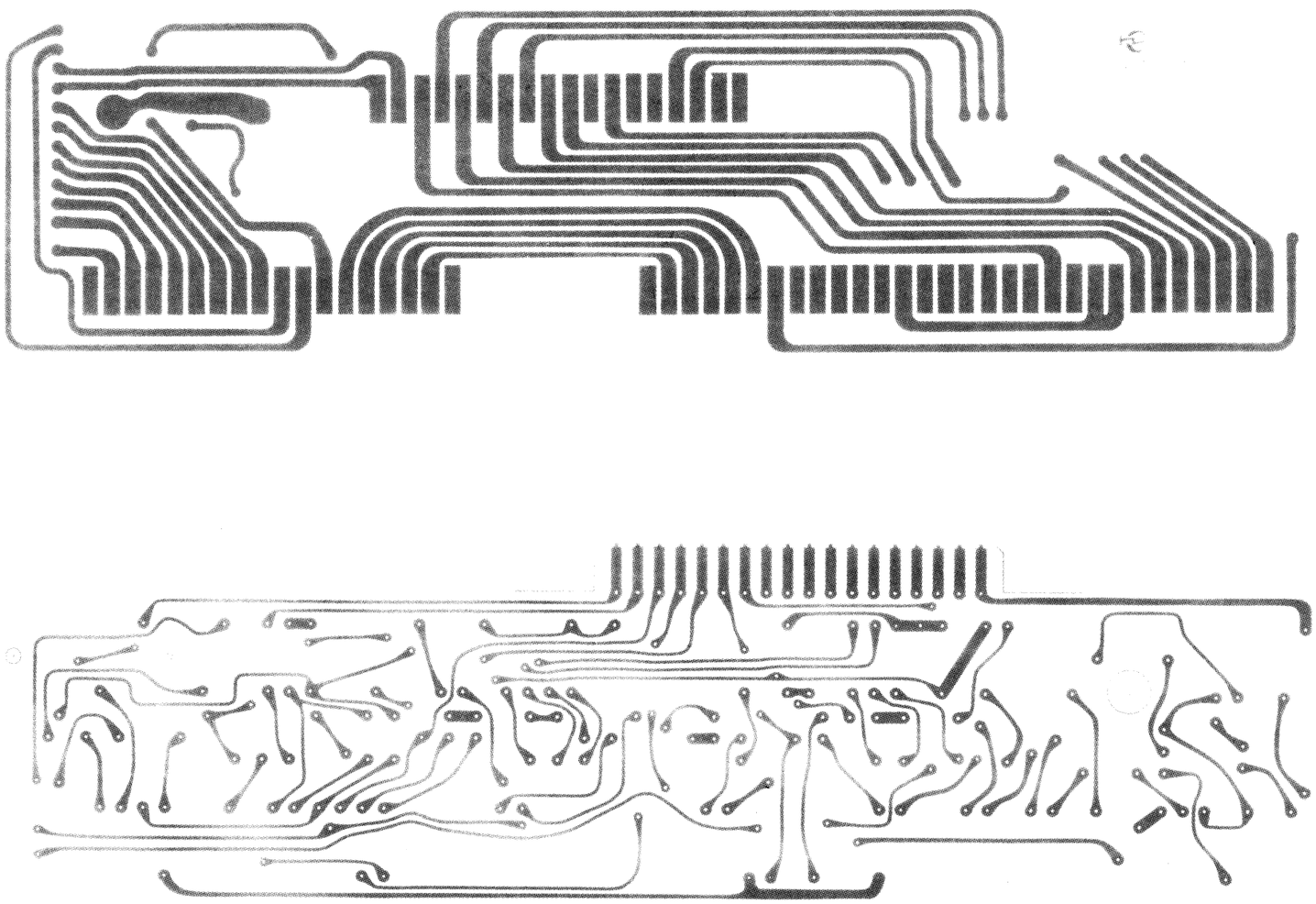
TR102~110, 131, 132	2SA564A
TR101, 111~130	2SC828A
TR151~154	2SK30A
D101, 102, 104, 105, 106, 108	MA150
D103	SVDRD9.1EBS
D107	SVDRD5.6ECS

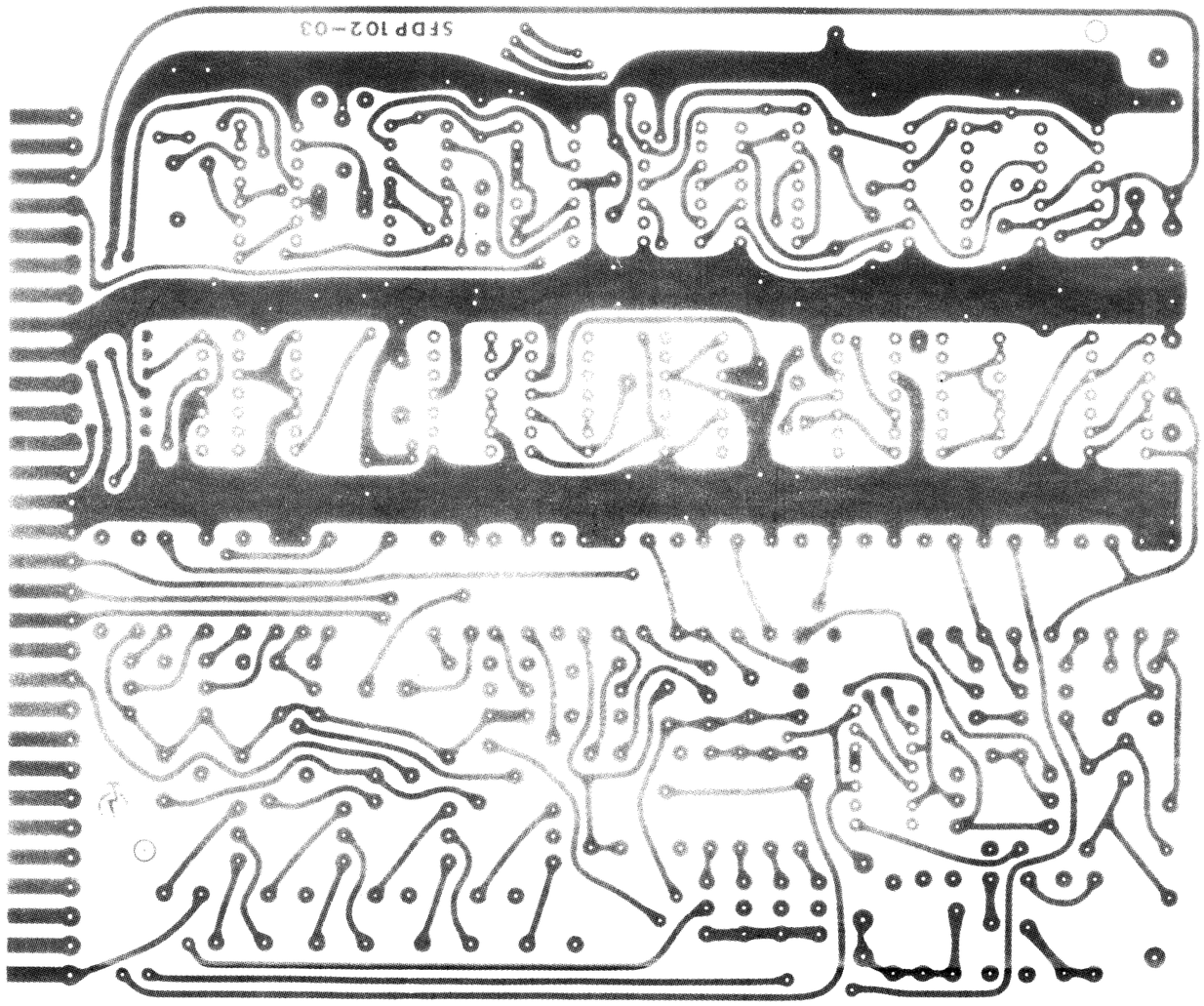
This schematic diagram maybe modified at any time with the development of new technology.

Printed circuit board pattern seen from above.

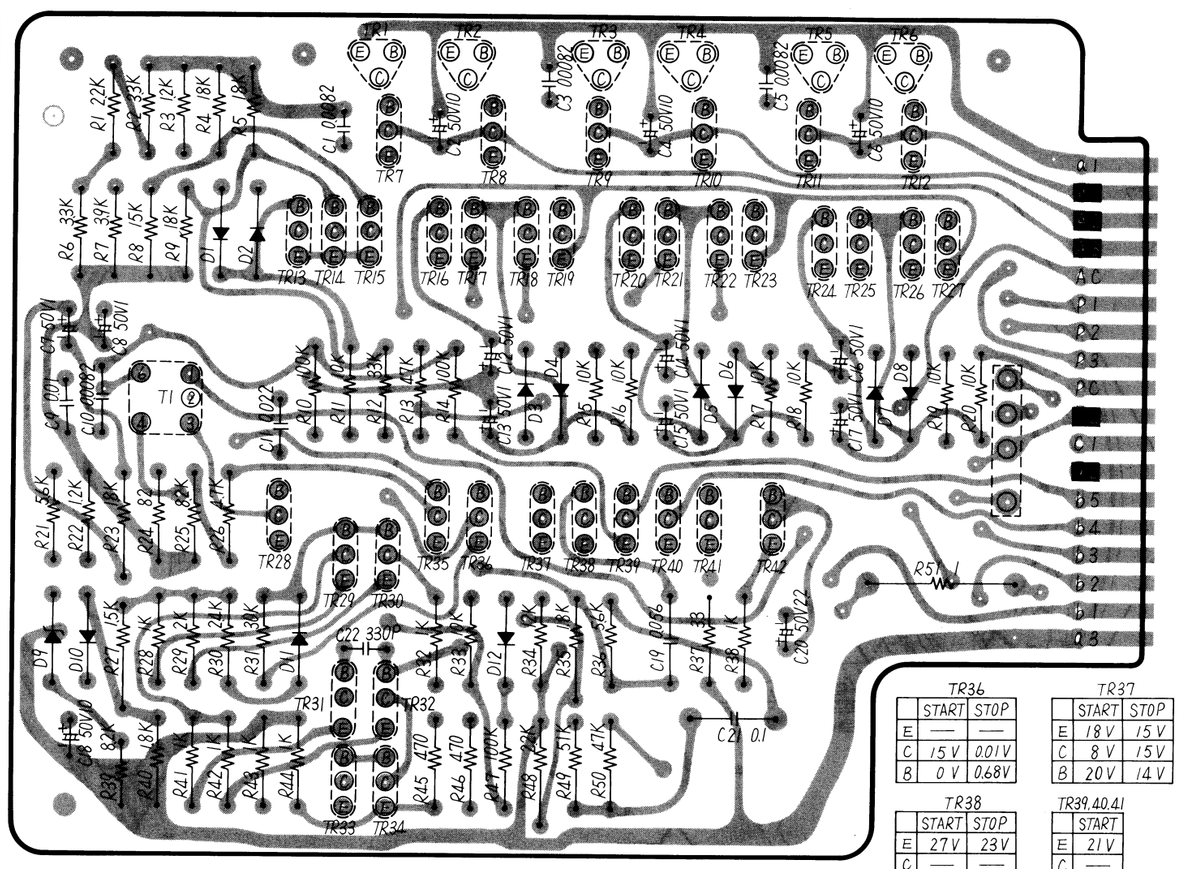







SFDP102-03

Circuit Board Wiring View (Drive Circuit) ..... Model SP-10MKII-(X)



TR1.3.5	START
E	—
C	17 V
B	32 V

TR7.9.11	START
E	32 V
C	17 V
B	31 V

TR2.4.6	START	STOP
E	0.02 V	0 V
C	17 V	23 V
B	-1.2 V	-1.7 V

TR8.10.12	START	STOP
E	-1.2 V	-1.7 V
C	17 V	23 V
B	-1 V	-1.5 V

TR13	START
E	16 V
C	27 V
B	17 V

TR14	START
E	16 V
C	20 V
B	15 V

TR15	START
E	16 V
C	21 V
B	15 V

TR16.20	START
E	20 V
C	31 V
B	20 V

TR17.21	START
E	21 V
C	31 V
B	21 V

TR24	START
E	20 V
C	31 V
B	20 V

TR18.22	START	STOP
E	17 V	14 V
C	-1 V	-1.5 V
B	21 V	—

TR19.23	START	STOP
E	17 V	14 V
C	-1 V	-1.5 V
B	20 V	—

TR25	START
E	21 V
C	31 V
B	—

TR28	START
E	5.2 V
C	—
B	5.8 V

TR26	START	STOP
E	17 V	14 V
C	-1 V	1.5 V
B	—	—

TR27	START	STOP
E	17 V	14 V
C	-1 V	-1.5 V
B	20 V	—

TR29	START
E	30 V
C	27 V
B	29 V

TR30	START
E	30 V
C	3 V
B	29 V

TR31	START
E	26 V
C	17 V
B	27 V

TR33	START
E	1 V
C	17 V
B	1.8 V

TR32	START	STOP
E	26 V	—
C	20 V	14 V
B	27 V	23 V

TR36	START	STOP
E	—	—
C	15 V	0.01 V
B	0 V	0.68 V

TR37	START	STOP
E	18 V	15 V
C	8 V	15 V
B	20 V	14 V

TR34	START
E	1.1 V
C	2.0 V
B	1.8 V

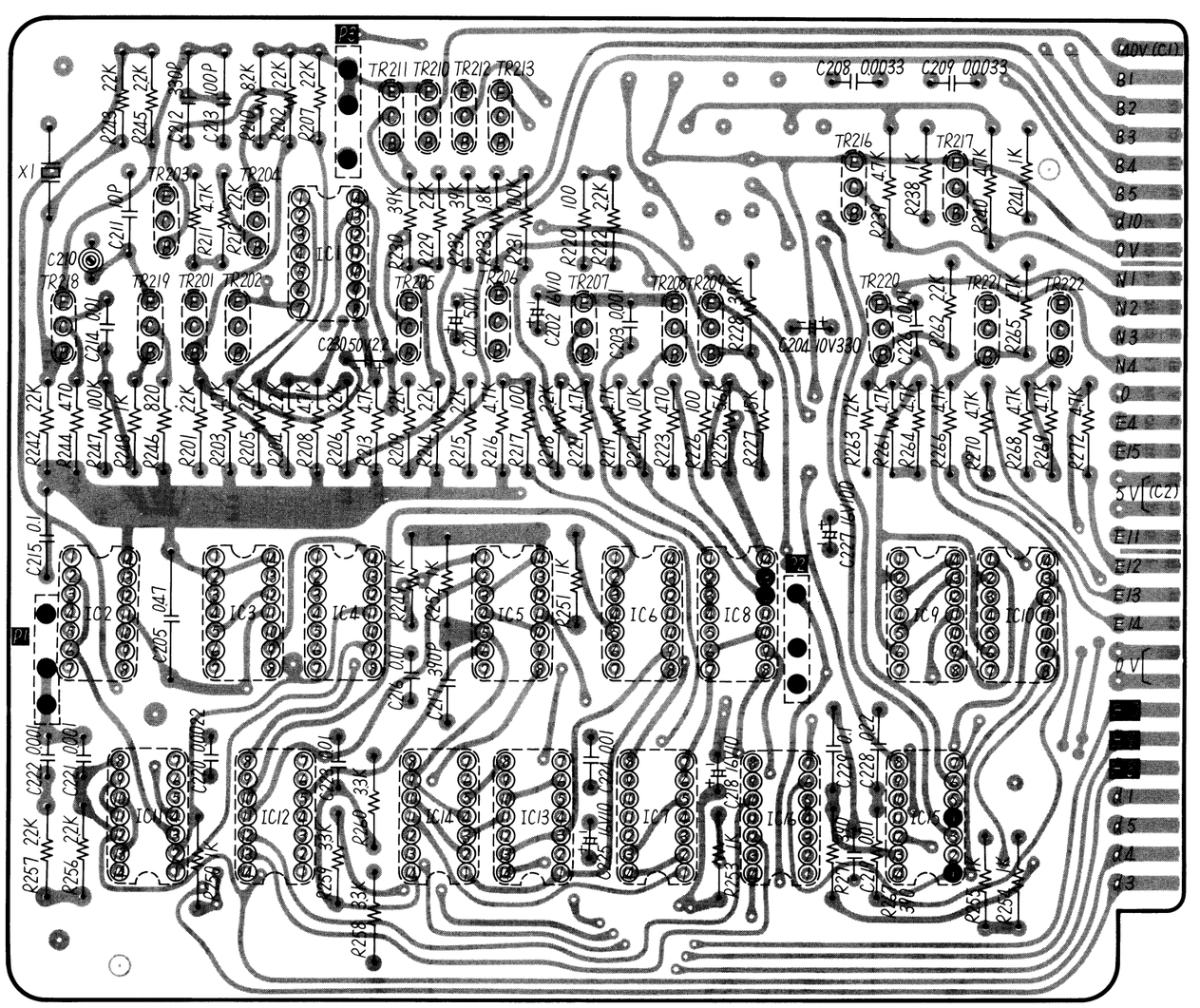
TR42	START
E	1.1 V
C	1.8 V
B	1.8 V

TR38	START	STOP
E	27 V	23 V
C	—	—
B	26 V	22 V

TR39.40.41	START
E	21 V
C	—
B	20 V

TR35	START	STOP
E	20 V	14 V
C	—	—
B	18 V	15 V

Circuit Board Wiring View (Logic Circuit) ..... Model SP-10MKII-(X)



TR205	START
E	—
C	0.01 V
B	—

TR206	START
E	—
C	0.03 V
B	0.71 V

IC12	START
2	3.9 V
4	0.1 V
6	0.14 V

TR207	START
E	—
C	4.8 V
B	0.13 V

IC8	START	STOP
12	3.5 V	0.1 V
13	0.21 V	3.9 V

TR209	START	STOP
E	—	—
C	1.2 V	0.12 V
B	0.03 V	0.7 V

TR210	START	STOP
E	—	—
C	1.2 V	0.08 V
B	0.21 V	0.72 V

TR211	START	STOP
E	—	—
C	2.6 V	0.04 V
B	0.21 V	0.66 V

IC11	START
1	4.9 V
2	4.8 V
3	0.12 V
4	4.8 V
5	4.9 V
6	0.12 V

TR212	START	STOP
E	—	—
C	6.7 V	0.17 V
B	0.21 V	0.73 V

TR218	START
E	2.2 V
C	4.4 V
B	2.4 V

TR213	START	STOP
E	—	—
C	3.2 V	0.16 V
B	0.21 V	0.76 V

Circuit Board Wiring View (Control Circuit) ..... Model SP-10MKII-(X)

TR111	START
E	0.6 V
C	1 V
B	1.3 V

TR101	START
E	1.8 V
C	2.6 V
B	2.5 V

TR115	START
E	—
C	0.15 V
B	0.77 V

TR116	START
E	—
C	0.5 V
B	0.11 V

TR117	START	STOP
E	—	—
C	6.1 V	0.47 V
B	0.13 V	—

TR118	START	STOP
E	6.1 V	0.41 V
C	2.0 V	3.1 V
B	0.7 V	0.71 V

TR151	START	STOP
D	—	—
S	1.3 V	2.0 V
G	—	—

TR122	START
E	—
C	3.2 V
B	0.11 V

TR123	START
E	—
C	0.07 V
B	0.06 V

TR108	START	STOP
E	2.1 V	—
C	0 V	0.8 V
B	2.7 V	2.0 V

TR124	START	STOP
E	—	—
C	2.8 V	0.05 V
B	0 V	0.64 V

TR125	START	STOP
E	—	—
C	4.4 V	0.08 V
B	0 V	0.66 V

Circuit Board Wiring View (Logic Circuit) ...... Model SP-10MKII-(X)

TR205

	START
E	—
C	0.01V
B	—

TR206

	START
E	—
C	0.03V
B	0.71V

IC12

	START
2	3.9V
4	0.1V
6	0.14V

TR207

	START
E	—
C	4.8V
B	0.13V

IC8

	START	STOP
12	3.5V	0.1V
13	0.21V	3.9V

TR209

	START	STOP
E	—	—
C	1.2V	0.12V
B	0.03V	0.7V

TR210

	START	STOP
E	—	—
C	1.2V	0.08V
B	0.21V	0.72V

TR211

	START	STOP
E	—	—
C	26V	0.04V
B	0.21V	0.66V

IC11

	START
1	4.9V
2	4.8V
3	0.12V
4	4.8V
5	4.9V
6	0.12V

TR212

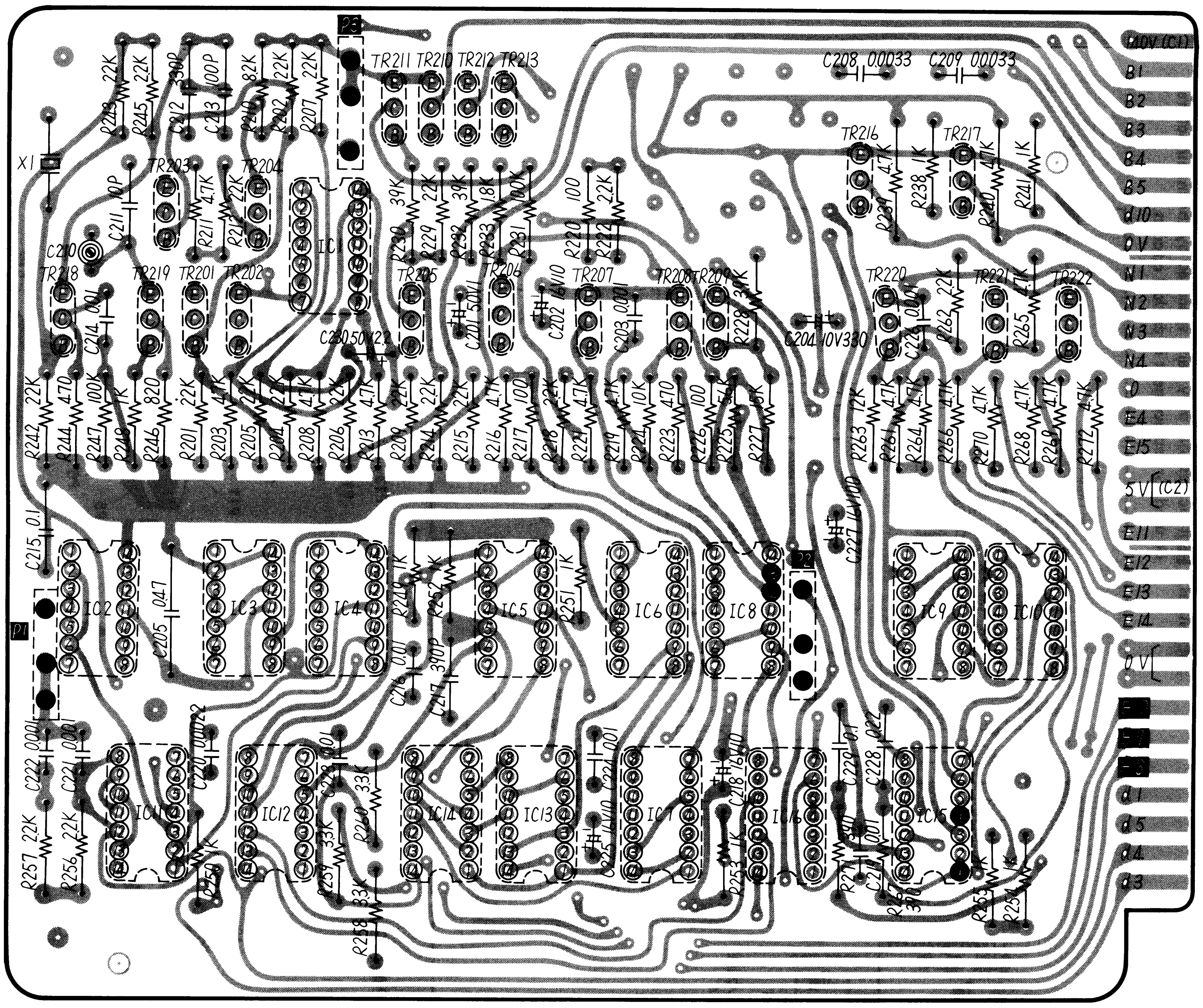
	START	STOP
E	—	—
C	6.7V	0.17V
B	0.21V	0.73V

TR218

	START
E	2.2V
C	4.4V
B	2.4V

TR213

	START	STOP
E	—	—
C	32V	0.16V
B	0.21V	0.76V



Circuit Board Wiring View (Control Circuit) ...... Model SP-10MKII-(X)

TR111

	START
E	0.6V
C	1V
B	1.3V

TR101

	START
E	1.8V
C	26V
B	25V

TR115

	START
E	—
C	0.15V
B	0.77V

TR116

	START
E	—
C	0.5V
B	0.11V

TR117

	START	STOP
E	—	—
C	6.1V	0.47V
B	0.13V	—

TR118

	START	STOP
E	6.1V	0.41V
C	20V	31V
B	0.7V	0.71V

TR151

	START	STOP
D	—	—
S	13V	20V
G	—	—

TR122

	START
E	—
C	32V
B	0.11V

TR123

	START
E	—
C	0.07V
B	0.06V

TR108

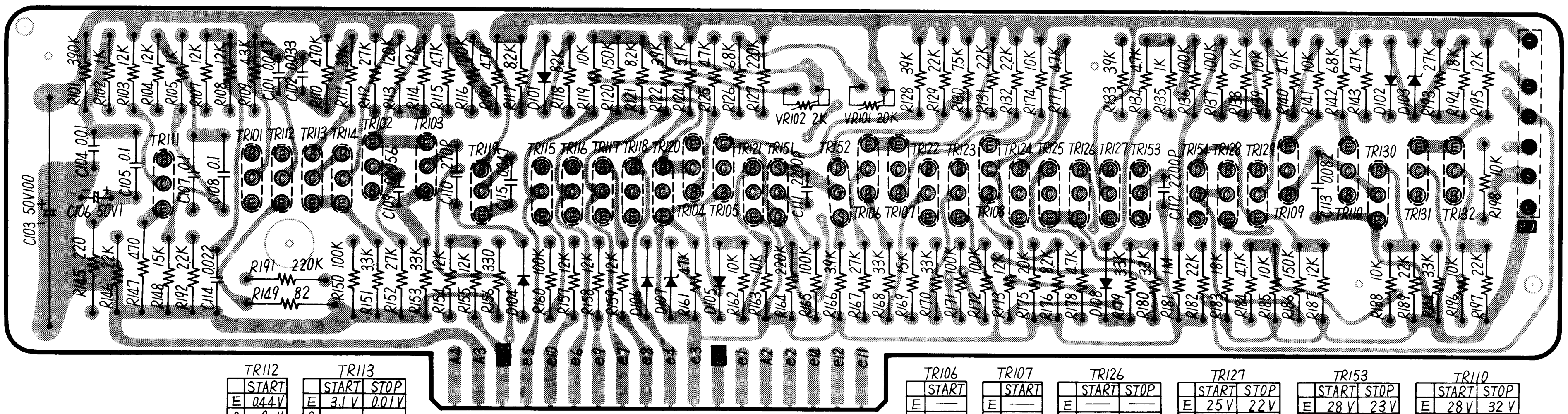
	START	STOP
E	21V	—
C	0V	0.8V
B	27V	20V

TR124

	START	STOP
E	—	—
C	28V	0.05V
B	0V	0.64V

TR125

	START	STOP
E	—	—
C	4.4V	0.08V
B	0V	0.66V



TR112

	START
E	0.44V
C	9V
B	1.1V

TR113

	START	STOP
E	3.1V	0.01V
C	—	—
B	3.6V	—

TR106

	START
E	—
C	20V
B	32V

TR107

	START
E	—
C	32V
B	31V

TR126

	START	STOP
E	—	—
C	0.1V	3.8V
B	0.7V	—

TR127

	START	STOP
E	25V	22V
C	—	—
B	26V	23V

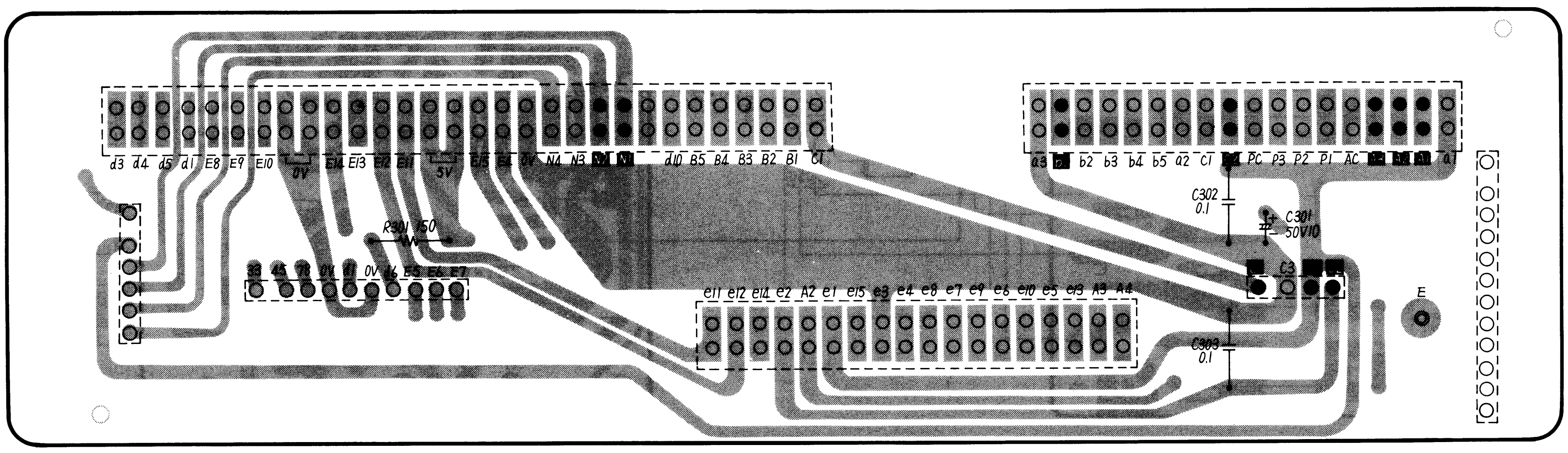
TR153

	START	STOP
E	28V	23V
C	11V	—
B	—	—

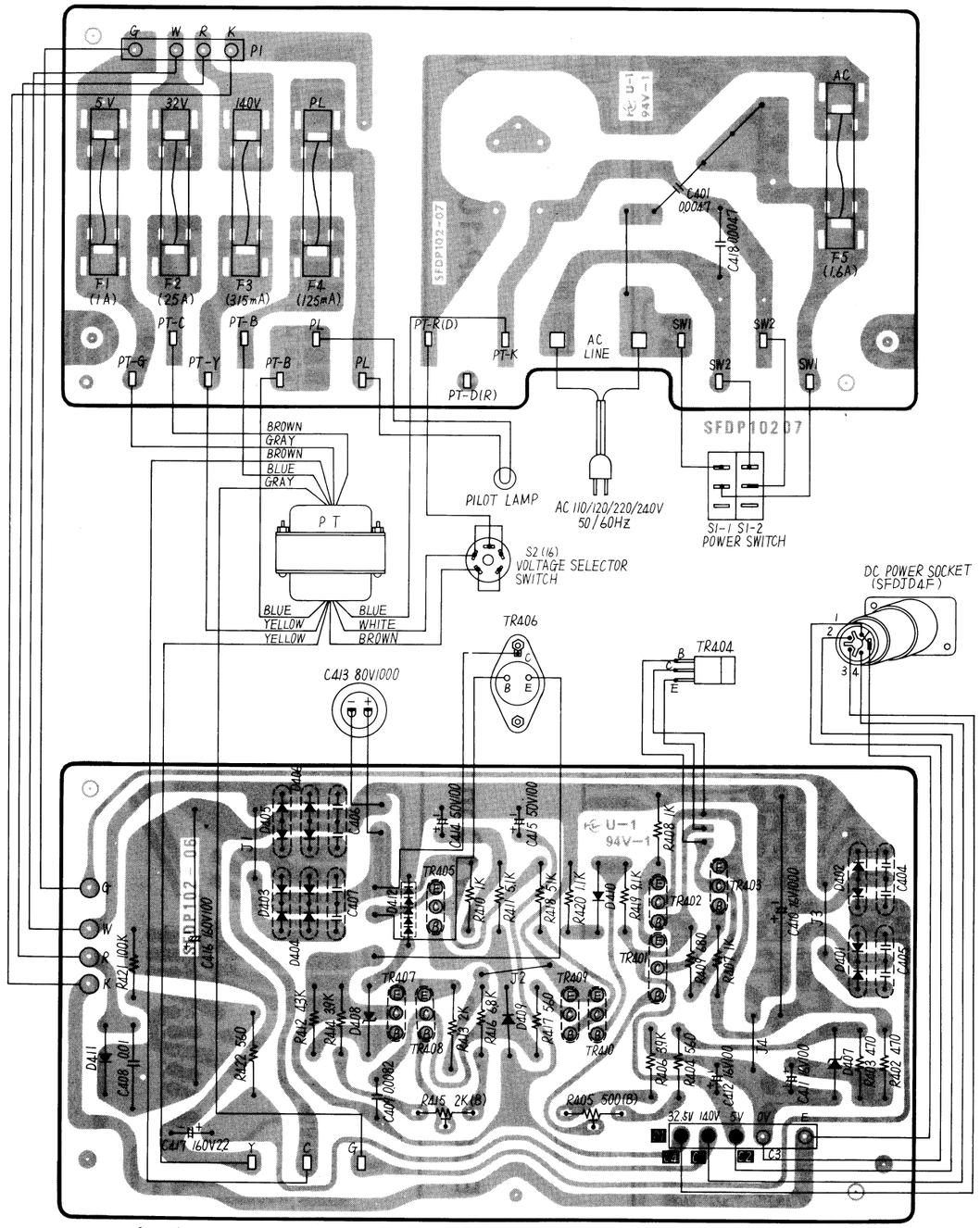
TR110

	START	STOP
E	28V	32V
C	7.7V	32V
B	27V	31V

Circuit Board Wiring View (Connectional Circuit) ...... Model SP-10MKII-(X)



Circuit Board Wiring View ..... Power Unit [SH-10E-(X)]



TR401, 402	START
E	43V
C	11V
B	5V

TR403	START
E	11V
C	5.7V
B	11V

TR404	START
E	5V
C	11V
B	5.7V

TR405	START
E	33V
C	5.1V
B	34V

TR406	START
E	325V
C	48V
B	33V

TR407	START
E	18V
C	325V
B	19V

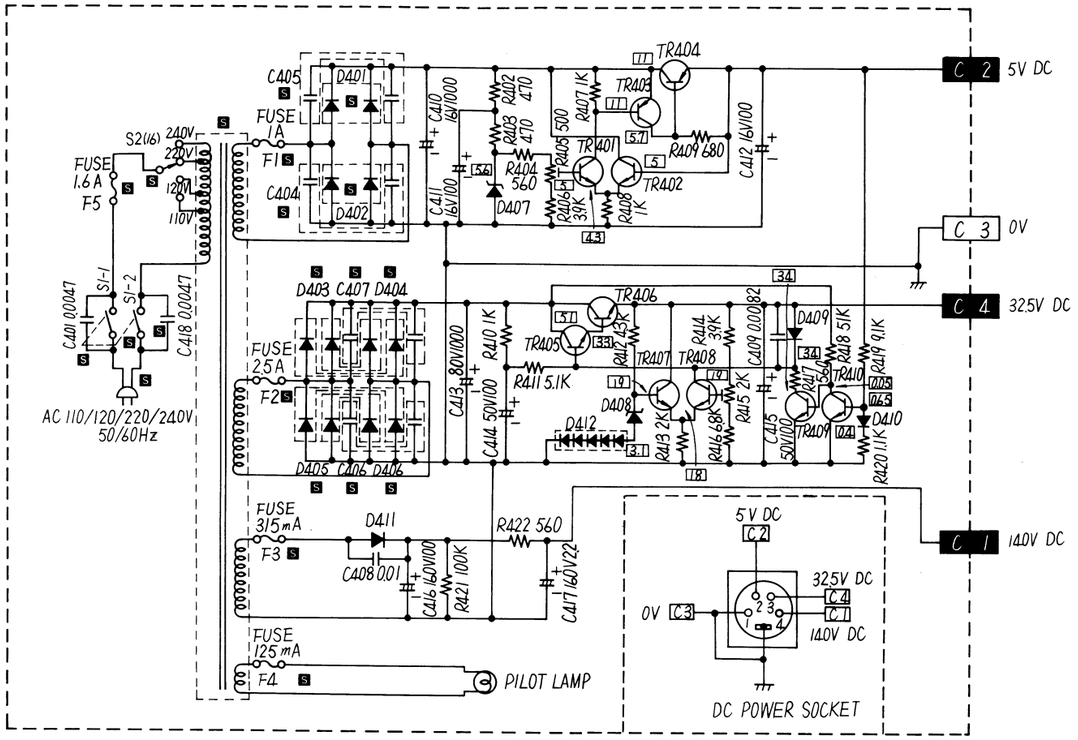
TR408	START
E	18V
C	34V
B	19V

TR409	START
E	3.1V
C	34V
B	0.05V

TR410	START
E	3.1V
C	0.05V
B	0.65V

Schematic Diagram ..... Power Unit [SH-10E-(X)]

Notes: S indicates that only parts specified by the manufacture be used for replacement in critical circuits.



■ PACKING PARTS

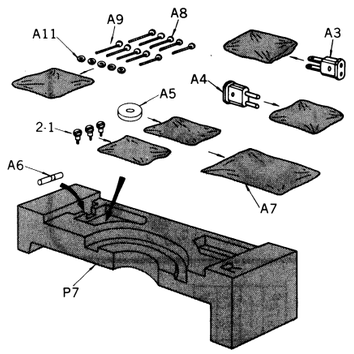


Fig. 16

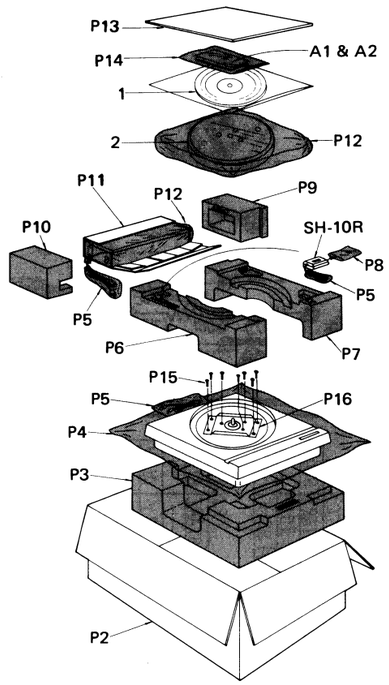
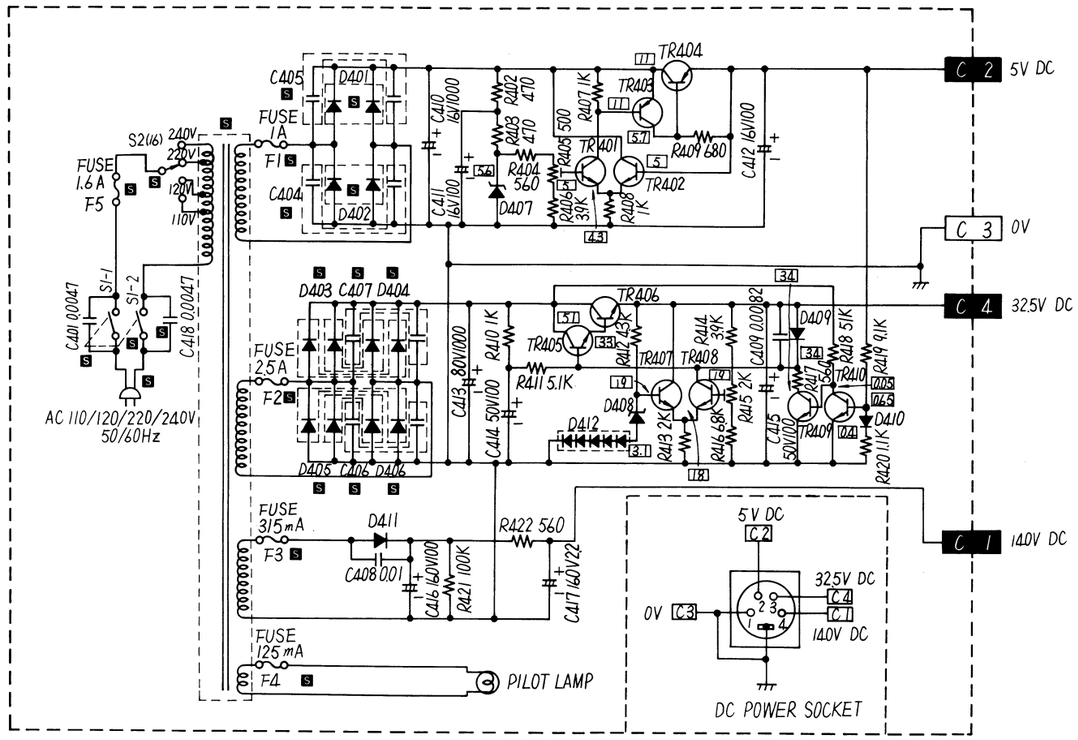


Fig. 17

E-(X)]

Schematic Diagram ..... Power Unit [SH-10E-(X)]

Notes: **S** indicates that only parts specified by the manufacture be used for replacement in critical circuits.



■ PACKING PARTS

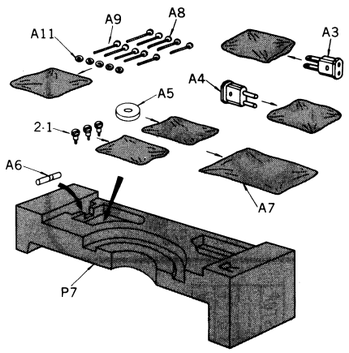


Fig. 16

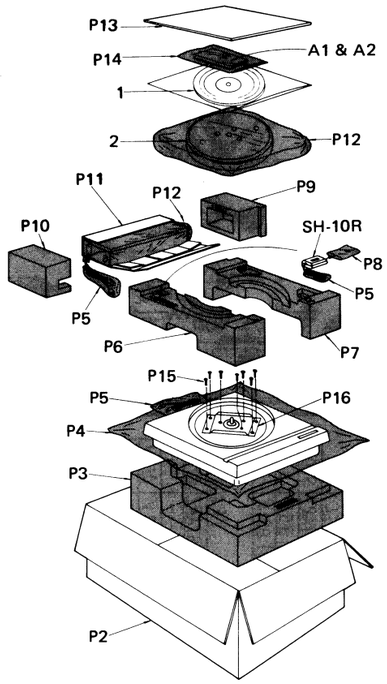


Fig. 17

Exploded View of Turntable ..... Model SP-10MKII-(X)

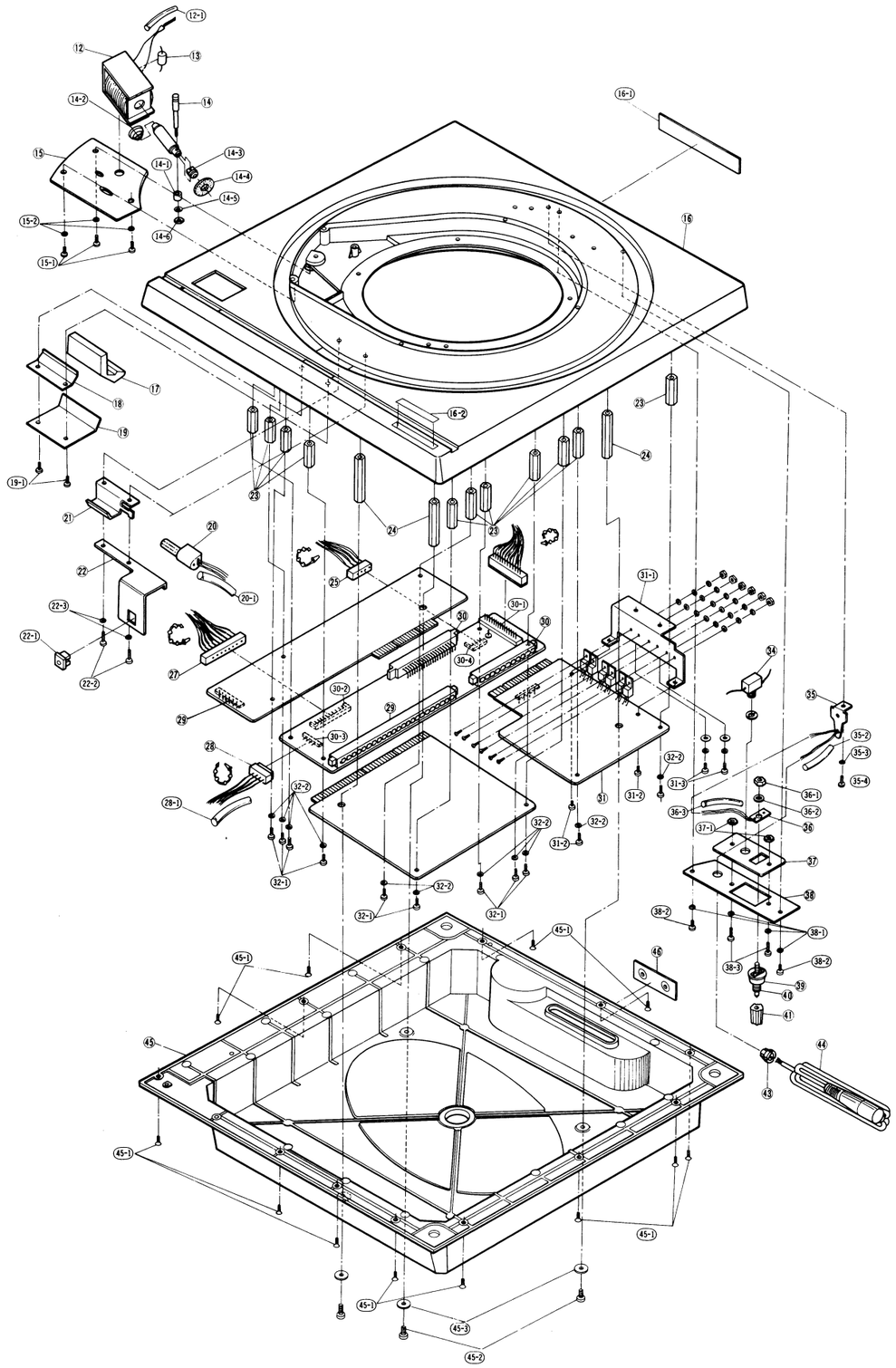


Fig. 18

Exploded View of Turntable ..... Model SP-10MKII-(X)

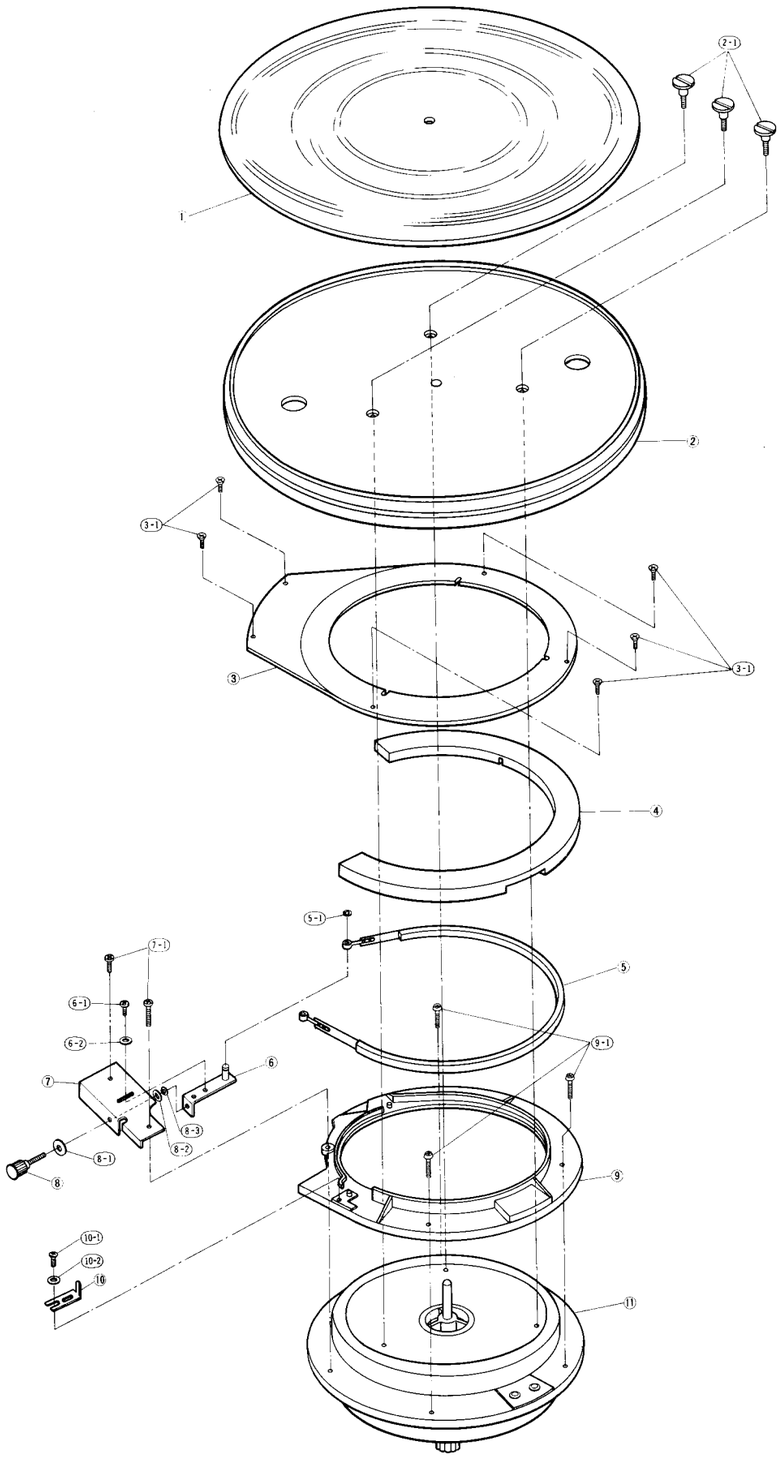


Fig. 19

Exploded View of Power Unit ..... Model SH-10E-(X)

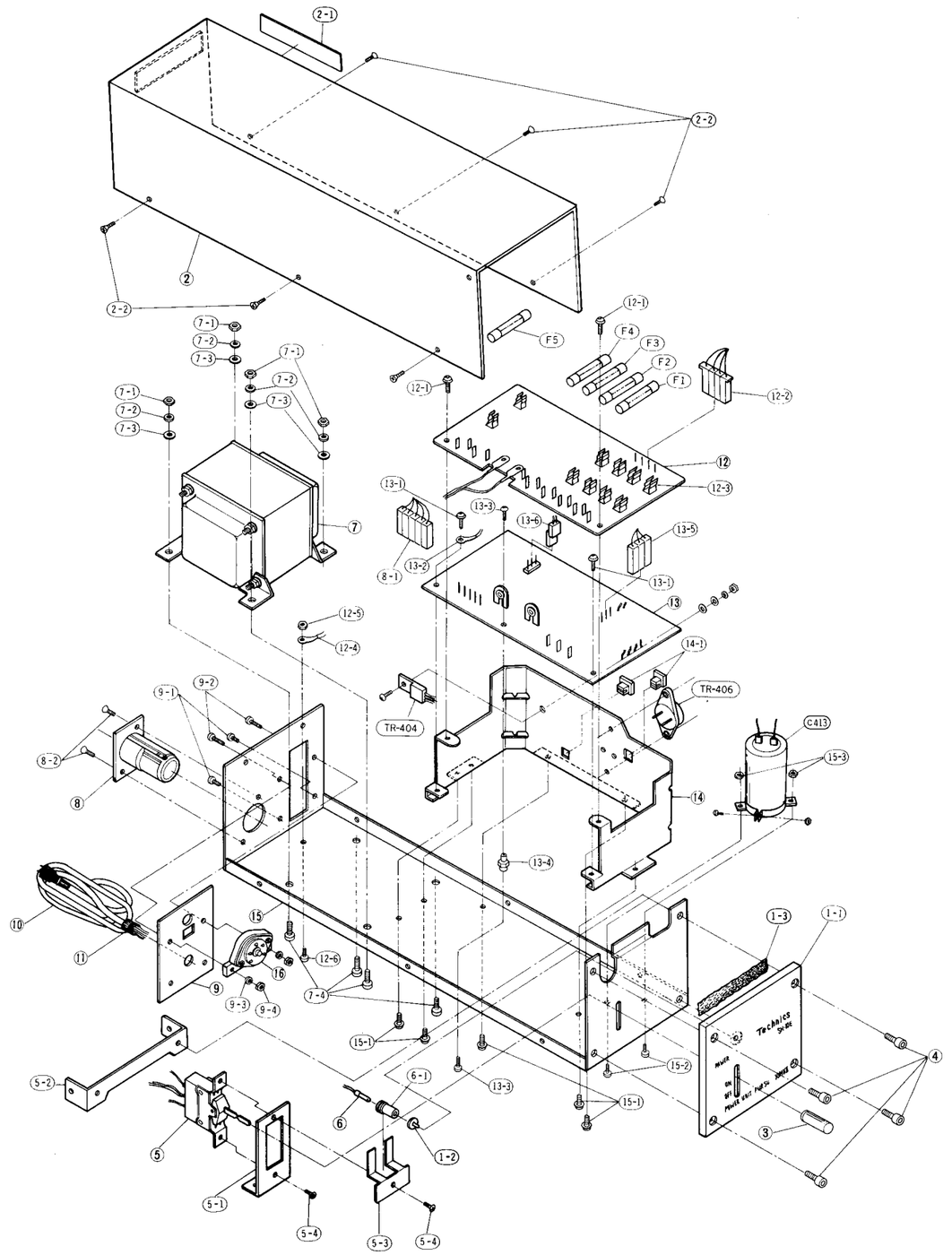


Fig. 20

Exploded View of Power Unit ..... Model SH-10E-(X)

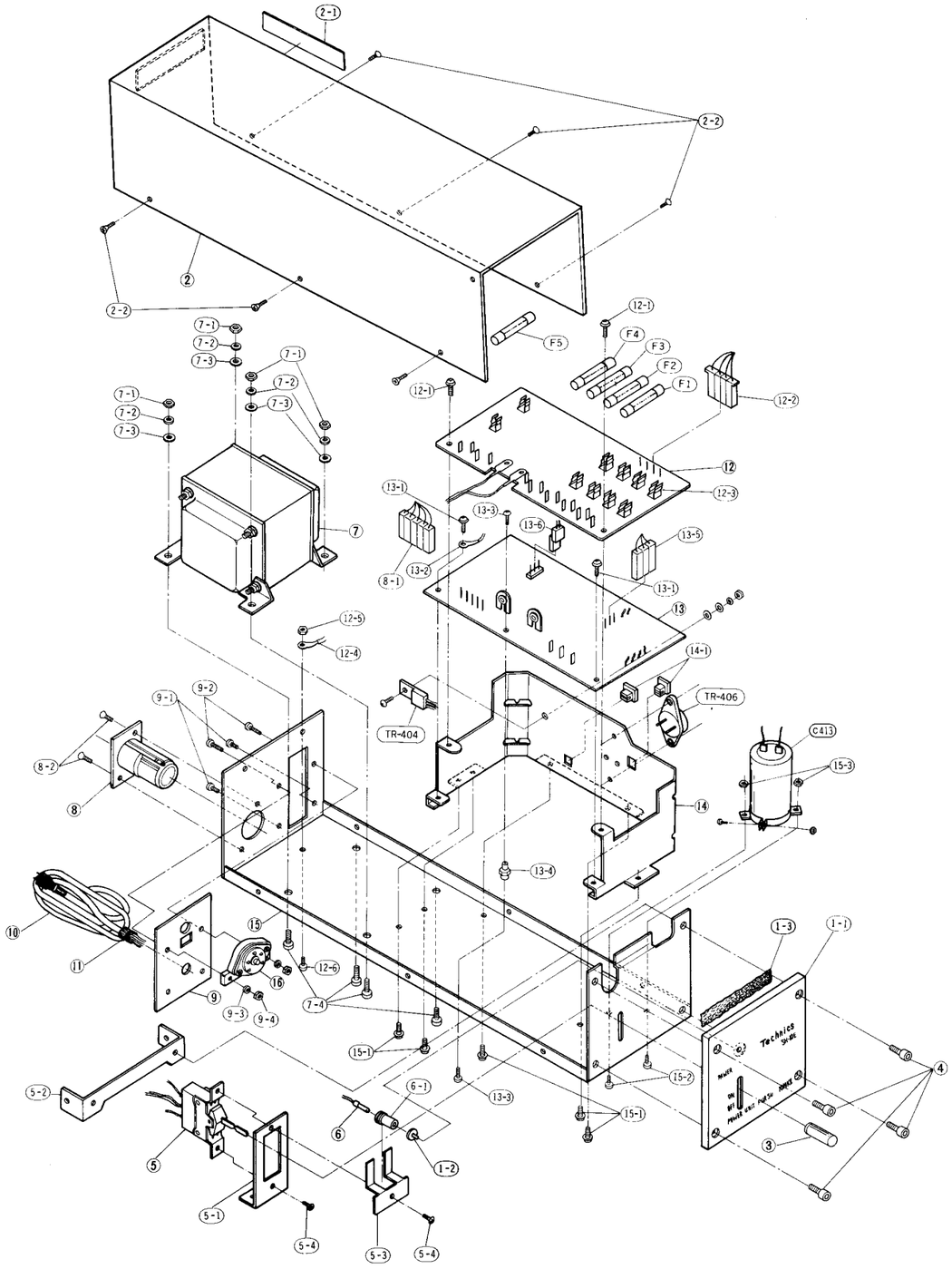


Fig. 20

Exploded View of Remote Control ..... Model SH-10R-(X)

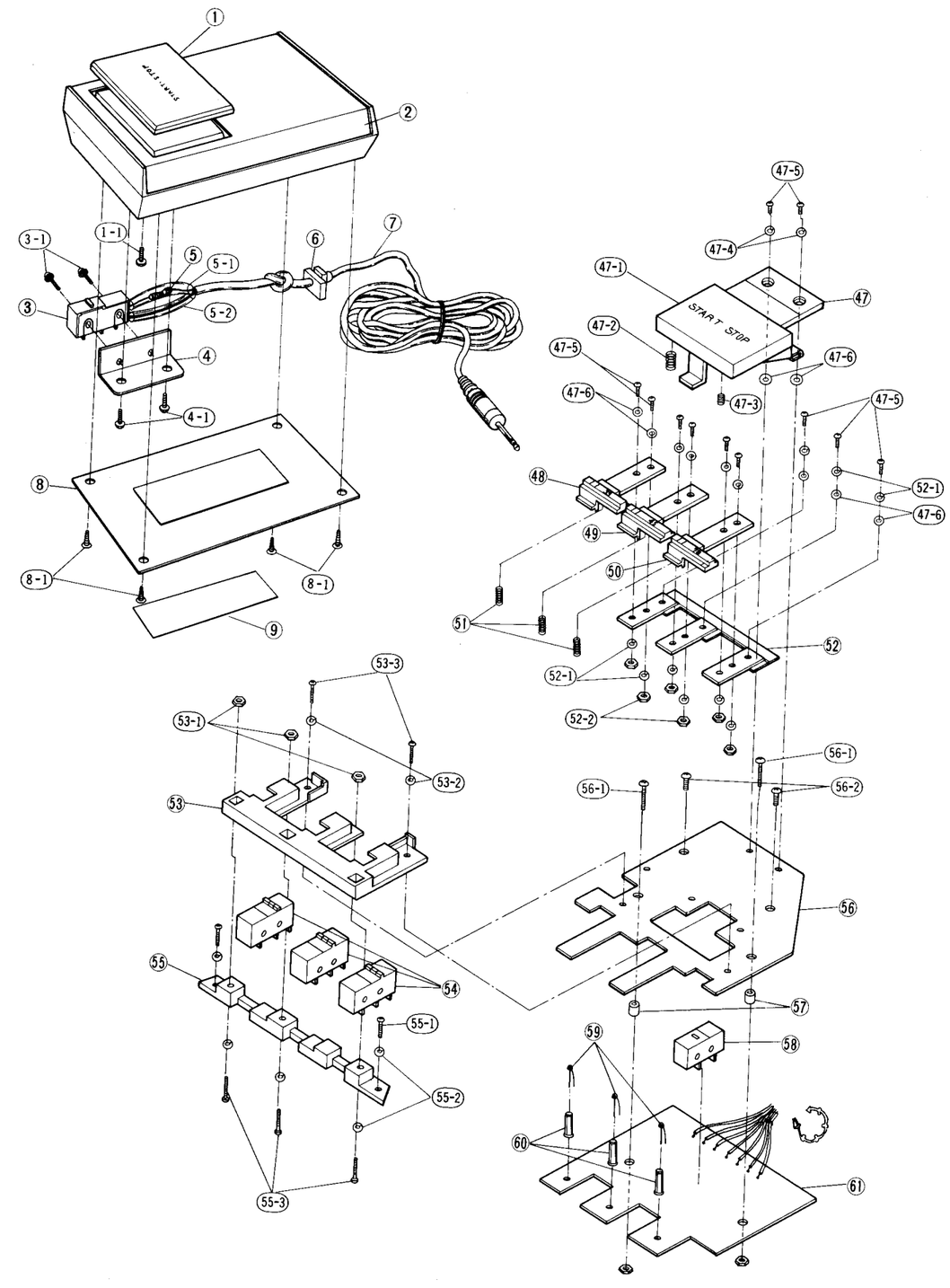


Fig. 21

REPLACEMENT PARTS LIST

NOTES: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. SAFETY Indicates, for safety reasons, that only parts specified in service manual be used for replacement.

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
DRIVE CIRCUIT BOARD					
Transistors					
TR1, 3, 5	2SB512-P	Transistors	3		
TR2, 4, 6	**2SD390A-Q**	Transistors	3		
TR7, 9, 11	**2SA752-Q**	Transistors	3		
TR8, 10, 12	**2SC1384A-Q**	Transistors	3		
TR13~17, 20, 21, 24, 25, 28 33~36, 42	**2SC1328-T**	Transistors	15		
TR18, 19, 22, 23, 27, 29~32, 37~41	**2SA666AI-R**	Transistors	15		
Diodes					
D1, 2, 10, 11	MA150	Diodes	4		
D3~8, 12	OA90	Diodes	7		
D9	SVDRD5.6ECS	Diode	1		
Transformer					
T1	ELM10S123	Oscillator	1		
Resistors					
R28, 38, 43, 44	ER050CKF1001	1KΩ 1/2W ± 1% Metallic	4		
R29	ER050CKF2001	2KΩ 1/2W ± 1% Metallic	1		
R51	**ERX2ANJ1R0**	1Ω 2W ± 5% Metallic	1		
R37	**ERD12FJ3R3**	3.3Ω 1/2W ± 5% Carbon	1		
R24	**ERD12FJ820**	82Ω 1/2W ± 5% Carbon	1		
R3, 22	**ERD12FJ122**	1.2KΩ 1/2W ± 5% Carbon	2		
R27	**ERD50TJ152**	1.5KΩ 1/2W ± 5% Carbon	1		
R23, 35, 40	**ERD50TJ182**	1.8KΩ 1/2W ± 5% Carbon	3		
R48	**ERD50TJ222**	2.2KΩ 1/2W ± 5% Carbon	1		
R1	**ERD25TJ222**	2.2KΩ 1/4W ± 5% Carbon	1		
R30	**ERD25TJ242**	2.4KΩ 1/4W ± 5% Carbon	1		
R2, 6	**ERD25TJ332**	3.3KΩ 1/4W ± 5% Carbon	2		
R7	**ERD25TJ392**	3.9KΩ 1/4W ± 5% Carbon	1		
R26	**ERD25TJ472**	4.7KΩ 1/4W ± 5% Carbon	1		
R21, 36	**ERD25TJ562**	5.6KΩ 1/4W ± 5% Carbon	2		
R45, 46	**ERD25TJ471**	470Ω 1/4W ± 5% Carbon	2		
R32, 41, 42	**ERD25TJ102**	1KΩ 1/4W ± 5% Carbon	3		
R25, 39	**ERD25TJ822**	8.2KΩ 1/4W ± 5% Carbon	2		
R11, 15, 16, 17 18, 19, 20, 33	**ERD25TJ103**	10KΩ 1/4W ± 5% Carbon	8		
R34	**ERD25TJ123**	12KΩ 1/4W ± 5% Carbon	1		
R8	**ERD25TJ153**	15KΩ 1/4W ± 5% Carbon	1		
R4, 5, 9	**ERD25TJ183**	18KΩ 1/4W ± 5% Carbon	3		
R31	**ERD25TJ303**	30KΩ 1/4W ± 5% Carbon	1		
R12	**ERD25TJ333**	33KΩ 1/4W ± 5% Carbon	1		
R13, 50	**ERD25TJ473**	47KΩ 1/4W ± 5% Carbon	2		
R49	**ERD25TJ513**	51KΩ 1/4W ± 5% Carbon	1		
R10, 14, 47	**ERD25TJ104**	100KΩ 1/4W ± 5% Carbon	3		
Capacitors					
C22	ECQS1331K	330pF 125WV ±10% Styrol	1		
C1, 3, 5, 10	ECQM05822KZ	0.0082pF 50WV ±10% Polyester	4		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C9	ECQM05103KZ	0.01μF 50WV ±10% Polyester	1		
C11	ECQM05223KZ	0.022μF 50WV ±10% Polyester	1		
C19	ECQM05563KZ	0.056μF 50WV ±10% Polyester	1		
C21	ECQM05104KZ	0.1μF 50WV ±10% Polyester	1		
C7, 8, 12, 13, 14 15, 16, 17	**ECEA50V1**	1μF 50WV Electrolytic	8		
C20	**ECEA50V2R2**	2.2μF 50WV Electrolytic	1		
C2, 4, 6, 18	**ECEA50V10**	10μF 50WV Electrolytic	4		
LOGIC CIRCUIT BOARD					
Intergrated Circuits					
IC1, 14, 15	SVIM53200P	Intergrated Circuit	1		
IC2, 3, 5, 7, 8, 9, 10	SVIM53273P	Intergrated Circuit	7		
IC4, 6	SVIM53293P	Intergrated Circuit	2		
IC11	SVIM5946P	Intergrated Circuit	1		
IC12	SVIM53204P	Intergrated Circuit	1		
IC13, 16	SVIM53210P	Intergrated Circuit	2		
Transistors					
TR201~212 218~222	**2SC1328-T**	Transistors	17		
TR213	**2SC1384A-Q**	Transistor	1		
TR216, 217	2SC1573-Q	Transistors	2		
Resistors					
R210, 220, 226	**ERD25TJ101**	100Ω 1/4W ± 5% Carbon	3		
R267, 271	**ERD25TJ391**	390Ω 1/4W ± 5% Carbon	2		
R223, 244	**ERD25TJ471**	470Ω 1/4W ± 5% Carbon	2		
R246	**ERD25TJ821**	820Ω 1/4W ± 5% Carbon	1		
R238, 241, 248 249, 250, 251 252, 253, 254, 255	**ERD25TJ102**	1KΩ 1/4W ± 5% Carbon	10		
TR233	**ERD25TJ182**	1.8KΩ 1/4W ± 5% Carbon	1		
TR214, 218, 222	**ERD25TJ222**	2.2KΩ 1/4W ± 5% Carbon	7		
TR246, 256, 257, 262					
TR258, 259, 260	**ERD25TJ332**	3.3KΩ 1/4W ± 5% Carbon	3		
TR228	**ERD25TJ392**	3.9KΩ 1/4W ± 5% Carbon	1		
TR203, 208, 211, 213, 216, 219, 221, 261, 264, 265, 266, 268, 269, 270, 272	**ERD25TJ472**	4.7KΩ 1/4W ± 5% Carbon	15		
TR225	**ERD25TJ562**	5.6KΩ 1/4W ± 5% Carbon	1		
TR210	**ERD25TJ822**	8.2KΩ 1/4W ± 5% Carbon	1		
TR224	**ERD25TJ103**	10KΩ 1/4W ± 5% Carbon	1		
TR263	**ERD25TJ123**	12KΩ 1/4W ± 5% Carbon	1		
TR227	**ERD25TJ153**	15KΩ 1/4W ± 5% Carbon	1		
TR201, 202, 204 ~207, 209, 212, 215, 229, 242, 243	**ERD25TJ223**	22KΩ 1/4W ± 5% Carbon	12		
TR230, 232	**ERD25TJ393**	39KΩ 1/4W ± 5% Carbon	2		
TR231, 247	**ERD25TJ104**	100KΩ 1/4W ± 5% Carbon	2		
TR239, 240	ERG1ANJ472	4.7KΩ 1W ± 5% Metallic	2		
Capacitors					
C203, 221, 222, 226	ECQM05102KZ	0.001μF 50WV ±10% Polyester	4		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C220	ECQM05222KZ	0.0022μF 50WV ±10% Polyester	1		
C214, 216, 219, 223, 224	ECQM05103KZ	0.01μF 50WV ±10% Polyester	5		
C215, 229	ECQM05104KZ	0.1μF 50WV ±10% Polyester	2		
C228	ECQM05224KZ	0.22μF 50WV ±10% Polyester	1		
C205	ECQM05474KZ	0.47μF 50WV ±10% Polyester	1		
C208, 209	ECQM2332KZ	0.0033μF 50WV ±10% Polyester	2		
C211	ECQS5100K	10pF 50WV ±10% Styrol	1		
C213	ECQS1101K	100pF 125WV ±10% Styrol	1		
C212	ECQS1331K	330pF 125WV ±10% Styrol	1		
C217	ECQS1391K	390pF 125WV ±10% Styrol	1		
C201	**ECEA50V1**	1pF 50WV Electrolytic	1		
C230	**ECEA50V2R2**	2.2μF 50WV Electrolytic	1		
C202, 218, 225,	**ECEA16V10**	10μF 16WV Electrolytic	3		
C227	**ECEA16V100**	100μF 16WV Electrolytic	1		
C204	**ECEA10V330V**	330μF 10WV Electrolytic	1		
Variable Capacitor					
C210	ECV1ZW10X53	10pF Ceramic trimmer	1		
Crystal					
XI	TSS616-1K	3.5796MH Oscillater	1		
CONTROL CIRCUIT BOARD					
Transistors					
TR101, 113~130	**2SC1328-T**	Transistors	18		
TR102~108, 110, 131, 132,	**2SA666AI-R**	Transistors	10		
TR109	**2SA666AI-R**	Transistor	1		
TR111, 112, 120.	**2SC1328-T**	Transistors	3		
TR151~154	2SK30A-Y	Transistors	4		
Diodes					
D101, 102, 104, 105, 106, 108	MA150	Diodes	6		
D103	SVDRD9.1EBS	Diode	1		
D107	SVDRD5.6ECS	Diode	1		
Resistors					
R121	ERO25CKD8201	8.2KΩ 1/4W ± 5% Metallic	1		
R119	ERO25CKD1002	10KΩ 1/4W ± 5% Metallic	1		
R174	ERO25CKF1002	10KΩ 1/4W ± 1% Metallic	1		
R175	ERO25CKF2002	20KΩ 1/4W ± 1% Metallic	1		
R149	**ERD12FJ820**	82 Ω 1/2W ± 5% Carbon	1		
R145	**ERD12FJ221**	220Ω 1/2W ± 5% Carbon	1		
R156	**ERD12FJ331**	330Ω 1/2W ± 5% Carbon	1		
R147	**ERD12FJ471**	470Ω 1/2W ± 5% Carbon	1		
R192	**ERD25TJ222**	2.2KΩ 1/2W ± 5% Carbon	1		
R144	**ERD25TJ332**	3.3KΩ 1/4W ± 5% Carbon	1		
R122, 166	**ERD25TJ392**	3.9KΩ 1/4W ± 5% Carbon	2		
R115	**ERD25TJ472**	4.7KΩ 1/4W ± 5% Carbon	1		
R124	**ERD25TJ512**	5.1KΩ 1/4W ± 5% Carbon	1		
R130	**ERD25TJ752**	7.5KΩ 1/4W ± 5% Carbon	1		
R190	**ERD25TJ471**	470Ω 1/4W ± 5% Carbon	1		
R102, 105, 135	**ERD25TJ102**	1KΩ 1/4W ± 5% Carbon	3		
R131, 132	**ERD25TJ222**	2.2KΩ 1/4W ± 5% Carbon	2		
R151	**ERD25TJ332**	3.3KΩ 1/4W ± 5% Carbon	1		
R134, 177, 178, 184	**ERD25TJ472**	4.7KΩ 1/4W ± 5% Carbon	4		
R117, 118, 176	**ERD25TJ822**	8.2KΩ 1/4W ± 5% Carbon	3		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
R139, 141, 162, 163, 185, 188, 196, 198	**ERD25TJ103**	10KΩ 1/4W ± 5% Carbon	8		
R103, 104, 107, 108, 114, 154, 155, 157, 158, 159, 173, 187, 195	**ERD25TJ123**	12KΩ 1/4W ± 5% Carbon	13		
R148, 169	**ERD25TJ153**	15KΩ 1/4W ± 5% Carbon	2		
R183, 194	**ERD25TJ183**	18KΩ 1/4W ± 5% Carbon	2		
R129, 146, 182, 189, 197	**ERD25TJ223**	22KΩ 1/4W ± 5% Carbon	5		
R112, 152, 167, 193	**ERD25TJ273**	27KΩ 1/4W ± 5% Carbon	4		
R153, 168, 170, 179, 180	**ERD25TJ333**	33KΩ 1/4W ± 5% Carbon	5		
R111, 128, 133	**ERD25TJ393**	39KΩ 1/4W ± 5% Carbon	3		
R125, 140, 143, 161	**ERD25TJ473**	47KΩ 1/4W ± 5% Carbon	4		
R126, 142	**ERD25TJ683**	68KΩ 1/4W ± 5% Carbon	2		
R109	**ERD25TJ432**	4.3KΩ 1/4W ± 5% Carbon	1		
R138	**ERD25TJ913**	91KΩ 1/4W ± 5% Carbon	1		
R116, 136, 137, 150, 160, 165, 171, 172	**ERD25TJ104**	100KΩ 1/4W ± 5% Carbon	8		
R113	**ERD25TJ124**	120KΩ 1/4W ± 5% Carbon	1		
R120, 186	**ERD25TJ154**	150KΩ 1/4W ± 5% Carbon	2		
R127, 164, 191	**ERD25TJ224**	220KΩ 1/4W ± 5% Carbon	3		
R101	**ERD25TJ394**	390KΩ 1/4W ± 5% Carbon	1		
R110	**ERD25TJ474**	470KΩ 1/4W ± 5% Carbon	1		
R181	**ERD25TJ105**	1MΩ 1/4W ± 5% Carbon	1		
Variable Resistor					
VR101	**EVSPIAA00E24**	20KΩ	1		
VR102	**EVSPIAA00E23**	2KΩ	1		
Capacitor					
C110	ECQS1271K	270pF 125W ±10% Styrol	1		
C111, 112	ECQS1222KZ	2200pF 125W ±10% Styrol	2		
C109	ECQM05562KZ	0.0056μF 50W ±10% Polyester	1		
C104	ECQM05103KZ	0.01μF 50W ±10% Polyester	1		
C114	ECQM05223KZ	0.022μF 50W ±10% Polyester	1		
C102	ECQM05333KZ	0.033μF 50W ±10% Polyester	1		
C101, 115	ECQM05473KZ	0.047μF 50W ±10% Polyester	2		
C113	ECQM05823KZ	0.082μF 50W ±10% Polyester	1		
C105, 107, 108	ECQM05104KZ	0.1μF 50W ±10% Polyester	3		
C106	**ECEA50V1**	1μF 50W Electrolytic	1		
C103	**ECEB63V100**	100μF 50W Electrolytic	1		
CONNECTIONAL BOARD					
R301	**ERD25TJ151**	150Ω 1/4W ± 5% Carbon	1		
C301	**ECEA50V10**	10μF 50W Electrolytic	1		
C302, 303	ECQM05104KZ	0.1μF 50W ±10% Polyester	2		
CABINET AND CHASSIS PARTS					
1	SFTG102-01	Turntable mat	1		
2	SFTE102-01E	Turntable	1		
2-1	SFXJ102-08E	Screw, Turntable	3		
3	SFUP102-06	Cover, Brake	1		
3-1	XSS3+8FZS	Screw, Cover	5		
4	SFTG102-03	Rubber, Brakecover	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
5	SFUP102-09A	Brake, Band	1		
5-1	**XUC3FT**	Circlip, Brake band	1		
6	SFUP102-05E	Plate, Brake	1		
6-1	XYN3+C8FZS	Screw, Plate	1		
6-2	SFXW120-01	Washer, Plate	1		
7	SFUP102-07	Plate, Adjustment	1		
7-1	XYN3+C6FZS	Screw, Plate	2		
8	SFXJ102-02	Screw, Adjustment	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
35	SFER1E	Mounting, Ground wire	1		
35-2	SFEB3UT	Tube	1		
35-3	XWC3BFY	Washer	1		
35-4	XYN3+C6FZS	Screw	1		
36	SJT719	Mounting Plate	1		
36-1	XNG4HS	Nut	1		
36-2	XWA4BFR	Washer	1		
36-3	SFEB3UT	Tube	1		

R12	ERD25TJ333	33KΩ	1/4W	± 5%	Carbon	1		
R13, 50	ERD25TJ473	47KΩ	1/4W	± 5%	Carbon	2		
R49	ERD25TJ513	51KΩ	1/4W	± 5%	Carbon	1		
R10, 14, 47	ERD25TJ104	100KΩ	1/4W	± 5%	Carbon	3		
Capacitors								
C22	ECQS1331K	330pF	125WV	±10%	Styrol	1		
C1, 3, 5, 10	ECQM05822KZ	0.0082pF	50WV	±10%	Polyester	4		

242, 243								
TR230, 232	ERD25TJ393	39KΩ	1/4W	± 5%	Carbon	2		
TR231, 247	ERD25TJ104	100KΩ	1/4W	± 5%	Carbon	2		
TR239, 240	ERG1ANJ472	4.7KΩ	1W	± 5%	Metallic	2		
Capacitors								
C203, 221, 222, 226	ECQM05102KZ	0.001μF	50WV	±10%	Polyester	4		

Ref. No.	Part No.	Part Name & Description				Per Set		Remarks
C220	ECQM05222KZ	0.0022μF	50WV	±10%	Polyester	1		
C214, 216, 219, 223, 224	ECQM05103KZ	0.01μF	50WV	±10%	Polyester	5		
C215, 229	ECQM05104KZ	0.1μF	50WV	±10%	Polyester	2		
C228	ECQM05224KZ	0.22μF	50WV	±10%	Polyester	1		
C205	ECQM05474KZ	0.47μF	50WV	±10%	Polyester	1		
C208, 209	ECQM2332KZ	0.0033μF	50WV	±10%	Polyester	2		
C211	ECQS5100K	10pF	50WV	±10%	Styrol	1		
C213	ECQS1101K	100pF	125WV	±10%	Styrol	1		
C212	ECQS1331K	330pF	125WV	±10%	Styrol	1		
C217	ECQS1391K	390pF	125WV	±10%	Styrol	1		
C201	**ECEA50V1**	1pF	50WV		Electrolytic	1		
C230	**ECEA50V2R2**	2.2μF	50WV		Electrolytic	1		
C202, 218, 225,	**ECEA16V10**	10μF	16WV		Electrolytic	3		
C227	**ECEA16V100**	100μF	16WV		Electrolytic	1		
C204	**ECEA10V330V**	330μF	10WV		Electrolytic	1		
Variable Capacitor								
C210	ECV1ZW10X53	10pF	Ceramic trimmer			1		
Crystal								
XI	TSS616-1K	3.5796MH	Oscillater			1		

CONTROL CIRCUIT BOARD

Transistors								
TR101, 113~130	**2SC1328-T**	Transistors				18		
TR102~108, 110, 131, 132,	**2SA666AI-R**	Transistors				10		
TR109	**2SA666AI-R**	Transistor				1		
TR111, 112, 120.	**2SC1328-T**	Transistors				3		
TR151~154	2SK30A-Y	Transistors				4		
Diodes								
D101, 102, 104, 105, 106, 108	MA150	Diodes				6		
D103	SVDRD9.1EBS	Diode				1		
D107	SVDRD5.6ECS	Diode				1		
Resistors								
R121	ERO25CKD8201	8.2KΩ	1/4W	± 5%	Metallic	1		
R119	ERO25CKD1002	10KΩ	1/4W	± 5%	Metallic	1		
R174	ERO25CKF1002	10KΩ	1/4W	± 1%	Metallic	1		
R175	ERO25CKF2002	20KΩ	1/4W	± 1%	Metallic	1		
R149	**ERD12FJ820**	82 Ω	1/2W	± 5%	Carbon	1		
R145	**ERD12FJ221**	220Ω	1/2W	± 5%	Carbon	1		
R156	**ERD12FJ331**	330Ω	1/2W	± 5%	Carbon	1		
R147	**ERD12FJ471**	470Ω	1/2W	± 5%	Carbon	1		
R192	**ERD25TJ222**	2.2KΩ	1/2W	± 5%	Carbon	1		
R144	**ERD25TJ332**	3.3KΩ	1/4W	± 5%	Carbon	1		
R122, 166	**ERD25TJ392**	3.9KΩ	1/4W	± 5%	Carbon	2		
R115	**ERD25TJ472**	4.7KΩ	1/4W	± 5%	Carbon	1		
R124	**ERD25TJ512**	5.1KΩ	1/4W	± 5%	Carbon	1		
R130	**ERD25TJ752**	7.5KΩ	1/4W	± 5%	Carbon	1		
R190	**ERD25TJ471**	470Ω	1/4W	± 5%	Carbon	1		
R102, 105, 135	**ERD25TJ102**	1KΩ	1/4W	± 5%	Carbon	3		
R131, 132	**ERD25TJ222**	2.2KΩ	1/4W	± 5%	Carbon	2		
R151	**ERD25TJ332**	3.3KΩ	1/4W	± 5%	Carbon	1		
R134, 177, 178, 184	**ERD25TJ472**	4.7KΩ	1/4W	± 5%	Carbon	4		
R117, 118, 176	**ERD25TJ822**	8.2KΩ	1/4W	± 5%	Carbon	3		

Ref. No.	Part No.	Part Name & Description				Per Set		Remarks
R139, 141, 162, 163, 185, 188, 196, 198	**ERD25TJ103**	10KΩ	1/4W	± 5%	Carbon	8		
R103, 104, 107, 108, 114, 154, 155, 157, 158, 159, 173, 187, 195	**ERD25TJ123**	12KΩ	1/4W	± 5%	Carbon	13		
R148, 169	**ERD25TJ153**	15KΩ	1/4W	± 5%	Carbon	2		
R183, 194	**ERD25TJ183**	18KΩ	1/4W	± 5%	Carbon	2		
R129, 146, 182, 189, 197	**ERD25TJ223**	22KΩ	1/4W	± 5%	Carbon	5		
R112, 152, 167, 193	**ERD25TJ273**	27KΩ	1/4W	± 5%	Carbon	4		
R153, 168, 170, 179, 180	**ERD25TJ333**	33KΩ	1/4W	± 5%	Carbon	5		
R111, 128, 133	**ERD25TJ393**	39KΩ	1/4W	± 5%	Carbon	3		
R125, 140, 143, 161	**ERD25TJ473**	47KΩ	1/4W	± 5%	Carbon	4		
R126, 142	**ERD25TJ683**	68KΩ	1/4W	± 5%	Carbon	2		
R109	**ERD25TJ432**	4.3KΩ	1/4W	± 5%	Carbon	1		
R138	**ERD25TJ913**	91KΩ	1/4W	± 5%	Carbon	1		
R116, 136, 137, 150, 160, 165, 171, 172	**ERD25TJ104**	100KΩ	1/4W	± 5%	Carbon	8		
R113	**ERD25TJ124**	120KΩ	1/4W	± 5%	Carbon	1		
R120, 186	**ERD25TJ154**	150KΩ	1/4W	± 5%	Carbon	2		
R127, 164, 191	**ERD25TJ224**	220KΩ	1/4W	± 5%	Carbon	3		
R101	**ERD25TJ394**	390KΩ	1/4W	± 5%	Carbon	1		
R110	**ERD25TJ474**	470KΩ	1/4W	± 5%	Carbon	1		
R181	**ERD25TJ105**	1MΩ	1/4W	± 5%	Carbon	1		
Variable Resistor								
VR101	**EVSPIAA00E24**	20KΩ				1		
VR102	**EVSPIAA00E23**	2KΩ				1		
Capacitor								
C110	ECQS1271K	270pF	125W	±10%	Styrol	1		
C111, 112	ECQS1222KZ	2200pF	125W	±10%	Styrol	2		
C109	ECQM05562KZ	0.0056μF	50W	±10%	Polyester	1		
C104	ECQM05103KZ	0.01μF	50W	±10%	Polyester	1		
C114	ECQM05223KZ	0.022μF	50W	±10%	Polyester	1		
C102	ECQM05333KZ	0.033μF	50W	±10%	Polyester	1		
C101, 115	ECQM05473KZ	0.047μF	50W	±10%	Polyester	2		
C113	ECQM05823KZ	0.082μF	50W	±10%	Polyester	1		
C105, 107, 108	ECQM05104KZ	0.1μF	50W	±10%	Polyester	3		
C106	**ECEA50V1**	1μF	50W		Electrolytic	1		
C103	**ECEB63V100**	100μF	50W		Electrolytic	1		

CONNECTIONAL BOARD

R301	**ERD25TJ151**	150Ω	1/4W	± 5%	Carbon	1		
C301	**ECEA50V10**	10μF	50W		Electrolytic	1		
C302, 303	ECQM05104KZ	0.1μF	50W	±10%	Polyester	2		

CABINET AND CHASSIS PARTS

1	SFTG102-01	Turntable mat	1		
2	SFTE102-01E	Turntable	1		
2-1	SFXJ102-08E	Screw, Turntable	3		
3	SFUP102-06	Cover, Brake	1		
3-1	XSS3+8FZS	Screw, Cover	5		
4	SFTG102-03	Rubber, Brakecover	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
5	SFUP102-09A	Brake, Band	1		
5-1	**XUC3FT**	Circlip, Brake band	1		
6	SFUP102-05E	Plate, Brake	1		
6-1	XYN3+C8FZS	Screw, Plate	1		
6-2	SFXW120-01	Washer, Plate	1		
7	SFUP102-07	Plate, Adjustment	1		
7-1	XYN3+C6FZS	Screw, Plate	2		
8	SFXJ102-02	Screw, Adjustment	1		
8-1	SFXW303-1	Washer	1		
8-2	SFPEW12002	Washer	1		
8-3	**XUC4FT**	Washer	1		
9	SFUM102-01	Brake Hausing	1		
9-1	XYN4+15FZS	Screw	3		
10	SFUP102-15	Plate, Brake Adjustment	1		
10-1	XTV3+8BFZ	Screw, Adjustment Plate	1		
10-2	SFXW120-01	Washer, Adjustment Plate	1		
11	SFMZ102-01E	Motor Ass'y	1		
12	SFDZSD1AC10	Plunger	1		
12-1	SFEB3UT	Tube	1		
13	SVD1S1887	Diode	1		
14	SFXJ102-03	Lever, Plunger	1		
14-1	SFXO102-01	Spacer, Plunger	1		
14-2	SFQA102-01	Spring, Brake	1		
14-3	SFGH102-01	Rubber, Plunger	1		
14-4	SFGH102-02	Rubber, Washer	1		
14-5	XWA3BER	Washer	1		
14-6	XNG3HS	Nut	1		
15	SFUP102-12	Mounting Plate, Plunger	1		
15-1	XYN3+C5FZS	Screw, Mounting Plate	3		
15-2	SFXW120-01	Washer, Mounting Plate	3		
16	SFAC102-01	Panel case	1		
16-1	SFNN102X01	Name Plate	1		
16-2	SFKB102X01	Badge	1		
17	SFUM102-02	Neon lamp base, A	1		
18	SFUP102-01	Neon lamp base, B	1		
19	SFUP102-02	Neon lamp base, C	1		
19-1	XYN3+C6FZS	Screw, Neon lamp base	2		
20	SFDNNL78WM	Neon lamp	1		
20-1	SFEB3UT	Tube	1		
21	SFUP102-08	Holder, Neon lamp	1		
22	SFUP102-17	Holder, P. C. B	1		
22-1	SFEZ196	Spacer, P. C. B	1		
22-2	XYN3+C8FZS	Screw	2		
22-3	XWA3BFR	Washer	2		
23	SFXT102-05	Spacer, P. C. B	11		
24	SFXT102-04	Spacer, Bottom Case	3		
25	SFDJ12804S	Connector, 4P	1		
27	SFDJ12810S	Connector, 10P	1		
28	SFDJ12804S	Connector, 4P	1		
28-1	SFEB2AF	Tube	1		
29	SFDJSI4225	Connector	1		
30	SFDJSI4223	Connector	2		
30-1	SFDJ12812P	Connector, 12P	1		
30-2	SFDJ12910P	Connector, 10P	1		
30-3	SFDJ12906P	Connector, 6P	1		
30-4	SFDJ12904P	Connector, 4P	1		
31-1	SFUP102-11	Plate, Heat sink	1		
31-2	XYN3+C6FZS	Screw	4		
31-3	XSN3+6FUS	Screw	2		
32-1	XYN3+C6FZS	Screw	9		
32-2	XWA3BFR	Washer	13		
34	RJJ10C	Jack	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
35	SFER1E	Mounting, Ground wire	1		
35-2	SFEB3UT	Tube	1		
35-3	XWC3BFY	Washer	1		
35-4	XYN3+C6FZS	Screw	1		
36	SJT719	Mounting Plate	1		
36-1	XNG4HS	Nut	1		
36-2	XWA4BFR	Washer	1		
36-3	SFEB3UT	Tube	1		
37	SFUZ102-05	Mounting Plate, Socket	1		
37-1	XNG3HS	Nut	2		
38	SFUP102-03	Mounting Plate, Cord	1		
38-1	XWC3BFY	Washer	4		
38-2	XYN3+C8FZS	Screw	2		
38-3	XYN3+C6FZS	Screw	2		
39	SGE103	Terminal	1		
40	SNE281-1S	Terminal screw	1		
41	SNE273-1	Knob	1		
43	SFSR5N4	Bushing, cord	1		
44	SFDJ102-01E	Plug	1		
45	SFAU102-01	Bottom case	1		
45-1	XSS3+8FZS	Screw	12		
45-2	XYN3+C8FZS	Screw	2		
45-3	SFXW120-01	Washer	2		
45-4	SFGK102-01	Rubber cap	1		
45-5	SFUZ102-03	Felt	4		
46	SFNG102-02	Label Remort	1		
47	SFKT102-01	Plate, start stop switch	1		
47-1	SFKK102-01	Ornament, start stop switch	1		
47-2	SFQA102-03	Spring, start stop switch	1		
47-3	SFXJ102-06	Adjustment screw, start stop switch	1		
47-4	XWA2BFR	Washer	2		
47-5	XSN2+6	Screw	11		
47-6	XWE2C4BN	Washer	11		
48	SFKT102-02E	Plate, select 33	1		
49	SFKT102-03E	Plate, select 45	1		
50	SFKT102-04E	Plate, select 78	1		
51	SFQA102-02	Spring, select	3		
52	SFUM102-05	Mounting Plate, Switch	1		
52-1	XWA2BFR	Washer	3		
52-2	XNG2HBW	Nut	6		
53	SFUM102-06	Switch cover	1		
53-1	XNG2HBW	Nut	3		
53-2	XWA2BFR	Washer	2		
53-3	XSN2+6	Screw	2		
54	SFDSSSL1C	Micro switch	3		
55	SFUM102-07	Switch cover	1		
55-1	XSN2+6	Screw	2		
55-2	XWA2BFR	Washer	5		
55-3	XSN2+10FU	Screw	3		
56	SFUP102-04	Mounting Plate, select switch	1		
56-1	XYN3+C10F	Screw	2		
56-2	XYN3+C6FZS	Screw	2		
57	SYXO102-02	Spacer	2		
58	SFDSSSL1C	Micro switch	1		
59	LN22	Light Emitting Diode	3		
60	SFUM102-04	Holder, Diode	3		
61	SFDP102-05	Plate ass'y	1		
62	SFUP102-18	Plate	3		

POWER UNIT (Model SH-10E-(X))

Transistors					
TR401, 402, 407, 408, 409, 410	**2SC1328-T**	Transistors	6		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
TR403	2SC666AI-R	Transistor	1		
TR405	2SD389A-Q	Transistor	1		
TR406	2SD334	Transistor	1		
TR404	2SD389A-Q	Transistor	1		
		Diodes			
D401, 403, 404,	RVD10DC2	Diodes	3		SAFETY
D402, 405, 406	RVD10DC2R	Diodes	3		SAFETY
D407	SVDRD5, 6ECS	Diode	1		SAFETY
D408	SVDRD16EB	Diode	1		
D409	MA150	Diode	1		
D410	OA90	Diode	1		
D411	SVD1S1887	Diode	1		
D412	SVDSV05	Diode	1		
		Variable Resistor			
R405	**EVLSOAA00B52**	500Ω	1		
R445	**EVLSOAA00B23**	2KΩ	1		
		Fuse			
F1	XBA2C10TRO	1A	1		SAFETY
F2	XBA2C25TRO	2.5A	1		SAFETY
F3	XBA2C03TRO	315mA	1		SAFETY
F4	XBA2CO12SSO	125mA	1		SAFETY
F5	XBA2C16TRO	1.6A	1		SAFETY
		Resistors			
R401	**ERD50TJ4R7**	4.7Ω 1/2W ± 5% Carbon	1		SAFETY
R402, 403	**ERD25TJ471**	470Ω 1/4W ± 5% Carbon	1		
R404	**ERD25TJ561**	560Ω 1/4W ± 5% Carbon	1		
R406	**ERD25TJ392**	3.9KΩ 1/4W ± 5% Carbon	1		
R407, 408	**ERD25TJ102**	1KΩ 1/4W ± 5% Carbon	2		
R409	**ERD25TJ681**	680Ω 1/4W ± 5% Carbon	1		
R410	ERD12FJ102	1KΩ 1/2W ± 5% Carbon	1		
R411	**ERD25TJ512**	5.1KΩ 1/4W ± 5% Carbon	1		
R412	**ERD25TJ432**	4.3KΩ 1/4W ± 5% Carbon	1		
R413	**ERD50TJ202**	2KΩ 1/2W ± 5% Carbon	1		
R414	**ERD25TJ392**	3.9KΩ 1/4W ± 5% Carbon	1		
R416	**ERD25TJ682**	6.8KΩ 1/4W ± 5% Carbon	1		
R417, R422	**ERD25TJ561**	560Ω 1/4W ± 5% Carbon	1		
R418	**ERD25TJ513**	51KΩ 1/4W ± 5% Carbon	1		
R419	**ERD25TJ912**	9.1KΩ 1/4W ± 5% Carbon	1		
R420	**ERD25TJ112**	1.1KΩ 1/4W ± 5% Carbon	1		
R421	**ERD25TJ104**	100KΩ 1/4W ± 5% Carbon	1		
		Capacitors			
C401, 402	ECKDDS472ME	0.047μF 125AC ±20% Polyester	2		
C404, 405, 406, 407	RXAF102P22HD	0.01μFx2 500WV ±100% Ceramic	4		SAFETY
C408	ECQM6103MZ	0.01μF 600WV ±20% Polyester	1		
C409	ECQM05822KZ	0.0082μF 50WV ±10% Polyester	1		
C410	**ECEB16V1000V**	100μF 16WV Electrolytic	1		
C411, 412	**ECEA16V100V**	100μF 16WV Electrolytic	2		
C413	ECEM80R1000X	1000μF 80WV Electrolytic	1		SAFETY
C414, 415	**ECEA63V100V**	100μF 50WV Electrolytic	2		
C416	**ECEB160V100V**	100μF 160WV Electrolytic	1		
C417	**ECEA160V22V**	22μF 160WV Electrolytic	1		
		CABINET AND CHASSIS PARTS			
1-1	SFKK10EX01A	Panel ass'y, Front	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
1-2	SGLA9	Lamp Indicate	1		
1-3	SFUZ10E01	Felt	1		
2	SFUP10E02E	Case	1		
2-1	SFNN10EX01	Name Plate	1		
2-2	XST3+6FZS	Screw	10		
3	SBLA4-3	Knob, Power switch	1		
4	XVE3A8FZS	Screw	4		
5	SFDS10EX01	Power Switch	1		
5-1	SFUP10E03	Mounting Plate, Power switch	1		
5-2	SFUP10E09	Mounting Plate, Panel	1		
5-3	SFUP10E04	Holder, Lamp	1		
5-4	XYN3+C6FZS	Screw	2		
6	XAM37T150	Lamp	1		
6-1	SMZA6091	Rubber, Lamp	1		
7	ETP8593E	Power Transformer	1		
7-1	XNG4HS	Nut	4		
7-2	XWA4BFR	Washer	4		
7-3	XWA4G10FU	Washer	4		
7-4	XST4+8FZS	Screw	4		
8	SFDJ-D4F	Socket, DC	1		
8-1	SJS5505	Connector, 5P	1		
8-2	XSS3+10FNS	Screw	2		
9	SFUP10EX05	Mounting Plate, AC Cord	1		
9-1	XST3+6FZS	Screw	2		
9-2	XST3+12FZS	Screw	2		
9-3	XWA3BFR	Washer	2		
9-4	XNG3HS	Nut	2		
10	SFKP-419C	AC cord	1		
11	SFSR4N-4	Bushing, cord	1		
12	SFDP102-07	P. C. B. Fuse	1		
12-1	XTW3+10HFZ	Screw	2		
12-2	SJS5405	Connector, 4P	1		
12-3	SFDZ023X01	Holder, Fuse	10		
12-4	SFER1C	Terminal	1		
12-5	XNG3HS	Nut	1		
12-6	XST3+6FZS	Screw	1		
13	SFDP102-06	Power P. C. B	1		
13-1	XTW3+10HFZ	Screw	2		
13-2	SHE36	Clamper, wire	1		
13-3	XST3+6FZS	Screw	2		
13-4	SFXO10E01	Spacer	1		
13-5	SJS5307	Connector, 3P	1		
13-6	SFDJS3PSHF	Connector, 3P	1		
14	SFUP10E08	Mounting Plate	1		
14-1	SFEZ196	Sporting, P. C. B	2		
15	SFUZ102-03	Case, Bottom	1		
15-1	XTW3+10HFZ	Screw	4		
15-2	XST3+6FZS	Screw	2		
15-3	XNG3HS	Nut, Capacitor	2		
16	SFDSHXW103	Selector switch	1		SAFETY
16-1	SFUM130G01	Base, selector switch	1		SAFETY
		REMOTE CONTROL (Model SH-10R-(X))			
1	SFKK102-01	Oranment Plate, Start Stop	1		
1-1	SFXJ102-06	Screw	1		
2	SFUM10R01E	Case	1		
3	SFDSSSL1C	Micro switch	1		
3-1	XTN2+10	Screw	2		
4	SFUP10R02	Mounting Plate, Micro switch	1		
4-1	XTN2+6B	Screw	2		
5	**ERD25TJ101**	100Ω 1/8W ± 5% Carbon	1		
5-1	SFEB3UT	Tube	1		
5-2	SFEB2UT	Tube	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
6	SFGP10R01	Rubber, Bushing	1		
7	SFEZ10R01	Cord, Jack	1		
8	SFUP10R01	Bottom cover	1		
8-1	XTS3+8BFZ	Screw	4		
9	SFNN10RX01	Name Plate	1		
		ACCESSORY PARTS			
A1	SFNU102X01	Operating instructions	1		
A2	SQXA2004	Product Service Guide	1		
A3	SFDKI19118	2-Pin Plug	1		
A4	RJP17AS	Adaptor	1		
A5	SFWE010	45 Adaptor	1		
A6	SFWO010	Oil	1		
A7	SFYF09B15	Polyethlene Bag	1		
A8	XSN5+35S	Screw A	5		
A9	XSN5+43S	Screw B	5		
A10	SFXW650-2	Washer	5		
		PACKING MATERIALS			
P1	SFHP102X02	Outside Packing Case	1		
P2	SFHP102X01	Inside packing case	1		
P3	SFHH102-06	Bottom Pad	1		
P4	SFYCZ0A100	Polyethlene sheet	1		
P5	SFYF08A23	Polyethlene Bag	3		
P6	SFHH102-04	Side Pad (L)	1		
P7	SFHH102-05	Side Pad (R)	1		
P8	SFYF15A20	Polyethlene Bag	1		
P9	SFHH102-07	Side Pad, Power unit	1		
P10	SFHH102-08	Side Pad, Power unit	1		
P11	SFHD102-06	Case, Power unit	1		
P12	SFYF45A50	Polyethlene Bag	2		
P13	SFHD102-05	Top Pad, Turntable	1		
P14	SFYF27A39	Polyethlene Bag	1		
P15	XYN3+C6BS	Screw, Clumper	7		
P16	SFUP102-14E	Mounting Plate, Motor	1		